

THE RADIO GUNNER

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THE RADIO GUNNER



IN THE LABORATORY

THE RADIO GUNNER

Alexander Forbes

WITH ILLUSTRATIONS



BOSTON AND NEW YORK
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“Certainly they give men rewards for doing such things, but what reward can there be in any gift of Kings or peoples to match the enduring satisfaction of having done them, not alone, but with and through and by trusty and proven companions?”

KIPLING; *Sea Warfare*

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Drawn by Heman Fay, Jr.

THE RADIO GUNNER



CHAPTER I

A SCIENTIST IN THE MAKING

1

EARLY in the twentieth century the annual Memorial Day parade was passing through a New England town. The sun shone hotly down till the tarvia of the road felt soft and sticky underfoot. At the head of the procession the usual brass band led the way with martial music. Every one in the town was out, the older citizens for the most part standing reverently with uncovered heads, while the children, in anything but a solemn mood, tagged along on the flanks of the band.

Jim Evans, a boy of six years, stood by the sidewalk in front of the little white house in which he lived, his mother beside him, holding him by the hand. At the rhythmic crescendo of the approaching music, his pulse throbbed, and as the band swept by his eyes sparkled with delight. Then came the aged veterans of the Civil War in their faded blue uniforms, their grizzled white beards and wrinkled features giving them a quaintness in the child's eyes that made him want to call his mother's attention. He tugged at her hand and looked up at her. The look in her face struck wonder to his childish soul; there were tears in her eyes. He gazed at her in amazement. Tears had always been to him the expression of childish grievance —

nothing more. He had never seen them shed by a grown-up. To his inquiring mind a mystery had now presented itself. More than that, deep down within him there was an awakening of something he had never felt before. His mother looked down and saw the expression of wonder in the child's serious face. Her only answer was a tightening of her grip on his hand and a quiver of the lip.

The sound of the beating drum died away down the street; the procession was gone. The mother and child returned to the little garden behind the house. Seating herself in a garden chair, she took him in her lap.

"Jim," she said in a low tender voice, "my father would have been marching with those old men if he had lived. I remember so well when he said 'good-bye.' I was a little girl about as big as you are, and he picked me up in his arms and kissed me. Then he went away and never came back. He died fighting bravely for all of us who stayed behind."

Thus with the vision of the parade fresh in his eyes and the sound of martial music still ringing in his ears, and with the wonder of this new meaning of his mother's tears stirring his soul, the tradition of an heroic life and death, the most precious heritage of the mother, was handed on to Jim, the small boy. In after years he never saw a Memorial Day parade but the memory of that day rose vividly before him, and he never forgot what the day stood for.

2

Eleven years after this incident, one October afternoon, Jim Evans, now at boarding-school, had gone up into the laboratory in the top of the schoolhouse to finish an experiment with a new radio hook-up before putting on his football clothes. He had just become absorbed in his task

when he heard the ringing of a bell which sounded the fire alarm. Every boy in the school had his duty in the fire brigade assigned him, and all knew that this summons took precedence over everything.

Evans dropped his tools and ran to a window overlooking the school grounds. From his high position he could see the situation at a glance. The school grounds comprised a superb grove of stately white pines, the pride of the neighborhood. Within this grove, by its western border, was a pond, and north of the pond the grove was bounded for a short distance at its northwest corner by a small swamp, choked with dense vegetation, a place frequented by a great variety of bird life. West of the grove lay a wide expanse of low meadowland overgrown with tall grass and thick bushes. After weeks of drought the ground was parched and dry. A strong northwest wind was blowing, and a brush fire burning in the meadow was sweeping rapidly toward the pine grove, imminently threatening its destruction. Evans saw the boys dash into a building and then, emerging with buckets and brooms, start on a run, led by Sam Mortimer, chief of the fire brigade, to the south side of the pond. Here lay the greater part of the boundary between the meadow and the grove, and here it was that the shore of the pond was most easily approached, for on the north it was lined with the dense swamp vegetation. Evidently the plan of campaign was to form a bucket line from the pond along the western edge of the grove to its southern extremity. Evans could see that no one was detailed to deal with the fire north of the pond; apparently it was assumed that the natural moisture there would stop the fire. Now Evans had frequently haunted this swamp in search of birds, and knew that the drought had reduced it to a highly inflammable state. After a brief survey of

the situation, he ran downstairs and out toward the grove. By the time he was out on the grounds the entire school, boys and masters, had disappeared into the grove to the south of the pond. Evans ran for the swamp where the smoke told him the fire was already entering the dense growth of brush.

Into the thicket he plunged and clawed his way through the tall bushes till, half-suffocated with smoke, he reached the advancing line of the fire. Down he went on his hands and knees and began scraping away the dried leaves from the surface of the mud, now and again jumping to his feet and uprooting bushes where the density of the growth required it, then dropping again to his knees and working among the leaves like a terrier. Thus he made across the path of the fire a swath where the flames were stopped except in the strongest gusts of wind. Now and then one of these would blow a burning leaf across the swath and start the fire anew on the other side. Then Evans would jump back and stamp out the fresh blaze. Once, when a runaway blaze threatened to spread too fast to be stopped in this way, he threw himself on it and smothered it with his body.

With feverish effort he struggled against the advancing flames, fearful lest they should get beyond his control in the larger bushes and trees by the edge of the pond and thus set fire to the entire pine grove. But now he saw the water of the pond gleaming through the smoke not far ahead, and redoubled his efforts to carry his swath of bare earth to the water's edge. Half-blinded with smoke he dug and clawed and kicked away the leaves till at last he reached the muddy shore of the pond, and with vast relief saw the last of the flames expend themselves in the dried leaves west of the line.

He turned and walked back over the swath he had made, searching carefully for embers that might start the fire anew. Only smouldering embers did he find, and, stamping these out, he returned to the edge of the pond satisfied that no more danger lay in this quarter. He then skirted the shore of the pond and came to the south side where the rest of the boys, having put out the fire in that quarter with their bucket line, were assembling.

Evans approached the others, picking the thorns out of his fingers as he came.

When Mortimer saw him he said, "Well, Jim, where in thunder have you been?"

"In the swamp," was the answer.

"What, looking for birds? There's no fire there, is there?"

Evans looked at him a second before answering, then said quietly, "No."

"Didn't you hear the fire bell?" said Mortimer.

"Yes," said Evans.

"That's a nice example to set the younger boys!" said Mortimer. "How can we make anything of the fire brigade if the fellows in the graduating class quit in an emergency like that? You ought to be put in the jug."

The eyes of half a dozen boys standing near were on Evans, but he said nothing. The fire brigade was formally dismissed, and the boys repaired to the gymnasium where they dressed for football practice. As they were dressing, Evans spoke to no one, and no one spoke to him. In the line-up between the first and second teams, Evans, being one of the smallest on the squad, played quarterback on the second. Usually his game was not remarkable; he was criticized for too much deliberation in the choice of plays. To-day he seemed possessed; he was all over the field at

once, picking up the ball on fumbles, darting through the line and gaining ground, till Mortimer, captain of the first eleven, coached his team to watch Evans and stop him. In spite of all he could do to rally his team, Evans made a touchdown which resulted in the defeat of the first eleven by the second, a humiliation it had hitherto been spared.

As the boys were walking back to the locker building in their reeking football clothes, the head-master drew Mortimer aside and said to him: "Didn't you have your whole fire brigade on the south side of the pond?"

"Yes, sir," said Mortimer.

"I suppose you thought the swamp on the north side would be too wet to burn, and the fire would stop there anyway," said the head-master.

"Surely."

"I should have thought so, too," said the head-master; "there's usually standing water all through there. Fortunately some one who knew better than you or I went in there and saved the pine grove. I've just been looking over the ground and found that the fire had gone right into the middle of the swamp to where some one had scraped away the leaves and stopped it. It was dry as tinder everywhere. Have you any idea who could have done it?"

Mortimer was staggered.

"Jim Evans was in the swamp," he said. "It must have been he. And I called him down for not being on the job. Why didn't he tell me?"

Mortimer hastened to find Evans and ascertain the truth.

"Why didn't you tell me, you great chump?" he said.

"You seemed to take it for granted that I'd been making a fool of myself, and I suppose that made me sore. Anyway, I didn't feel like going into explanations with those other fellows looking on."

"Well, I'm going into explanations just as quick as I can," said Mortimer warmly.

"That's mighty white of you, Sam," said Evans, "but don't make too much fuss over it."

Mortimer lost no time in telling all who had heard his sharp rebuke — and more too — the truth of the matter.

3

The next year Evans and Mortimer were freshmen together in college. The friendship between them was firmly established, but in the larger number of boys with whom they were thrown the divergence of their tastes caused them to see less and less of each other. Mortimer was universally liked and socially prominent. Altogether he was a distinguished figure in his class. Evans devoted himself assiduously to scientific study, and in his leisure time his strong love of outdoor life usually led him away from, rather than toward, the haunts of men. For this reason, as well as because of his reserved and retiring disposition, he was socially comparatively obscure, though respected and beloved by the few with whom he became intimate.

Few would have supposed that one so obviously a leader as Mortimer could ever want to lean for support in any exigency of life on one younger than himself. Yet there were times when he felt depressed or when his philosophy of life seemed clouded with doubts. At such times he was apt to stroll over to Evans's room where the two friends would have a "heart-to-heart" talk, often lasting well into the night; and always the clouds of confusion or doubt would disappear.

The spring following their entrance into college came that great turning-point in history, when in April, 1917,

America entered the war. Mortimer enrolled in the first Plattsburg Camp where he applied himself so well to his training for the army that, in spite of being only twenty years old, he won the commission of first lieutenant. After many months in a training camp he was promoted to captain and sent overseas. His company continued in training in France till the last two months of the war when it was sent into action in the Argonne. Mortimer served with distinction and won an enviable citation.

Evans, being a proficient radio operator, enlisted at once in the navy and was put through the intensive course for radio electricians, and then sent abroad on a destroyer.

When he left his home the parting was not easy. His mother was a widow, and he her only child; he was all she had. But in the spirit with which the Spartan mothers gave to their sons the shields they were to carry into battle, saying as they did so, "Return with it, or on it," Jim Evans's mother bade him Godspeed with a brave smile on her lips. He had a tradition to live up to, and she thanked God he was able to do it.

During the last months of the war the destroyer to which Evans was attached was among those basing on Queens-town and performing the arduous duty of meeting the great convoys from the States, far out at sea, and escorting them through the danger zone to safety.

The life on these slim fighting ships was a strange one indeed. As they slid silently out of the harbor past Haul-bowline, three, four, or five in column, they never knew what might be in store for them. Then as they passed Daunt Rock and, forming their scouting line, plunged into the head seas that swept their narrow decks, there came the test of the sailor's morale. To learn to live and carry on in their cramped quarters, rolling, pitching, and thrash-

ing about till it seemed as if neither flesh and blood nor steel could stand it any longer, while the cold, gray rollers, washing over the ship from stem to stern, chilled the very soul, was a feat that seemed to call for even more than human powers of adaptation.

But it was not always rough and dreary. There were days of sparkling sunshine and calm seas, days when Evans's spirit expanded and he rejoiced in the grandeur of the ocean. And as he became more and more accustomed to the life, his love of the sea, born at first in his childhood acquaintance with it on the New England coast, became deeper, till it was woven into every fiber of his being.

Soon after the Armistice, Evans went to London on leave. He now wore the uniform of a Chief Petty Officer, having risen through the successive grades of radio electrician to chief. In London he met Sam Mortimer, and they had a happy evening together. Mortimer told of the days and nights at the front in mud, rain, shell-fire, and gas.

"How was it on the destroyers?" he asked of Evans.

"Pretty hard to stick it at first," was the answer. "In those early days when we first started bucking the head seas going out to seventeen degrees west to look for convoys, I'd just want to curl up in the lea of a stack where I could breathe fresh air and still not be drenched to the skin with the spray and green seas washing over the decks. I didn't care a hang half the time if I made good or not. And I was just crazy for the sight of the green hills of Ireland and the spires of Queenstown, the snug berth at the mooring buoy and the liberty party ashore. Then I waked up to the fact that the messages I had to copy in those tedious watches in the radio room were very close to the heart of our naval strategy; handling them mechanically

like an automaton, I was losing a golden opportunity to read the controlling mind. I began to notice things, and I saw a wonderful evolution going on. Sailing orders which at first required long messages were later transmitted in a few brief signals. Every month saw new growth of efficiency in handling communications and disposing the forces. We have the British chiefly to thank for that — especially Admiral Bayly.

“Toward the end I got to feel more like part of the ship; I got so I didn’t mind, no matter how rough it was, and then the real spirit of the sea got hold of me. As an old sailor said, life at sea clears the corruption of the beach right out of your system. I’ve got now so that when the old ship leaves Corkbeg Light astern and puts her nose into the Atlantic, I feel that I’m getting back into my native element.”

“I like the ocean on a nice calm day,” said Mortimer, “but I’d never feel like that.”

“What I want to do now more than anything,” said Evans, “is to go for a good long cruise in my own boat when I can go where I want, turn in when I want, and get up when I want.”

“I’ll do that with you when we get home,” said Mortimer.

“That’s a go,” echoed Evans warmly. “Don’t forget it.”

“You bet I won’t,” said Mortimer.

4

Before the end of the winter these two young men were back in college, finishing the courses they had begun. The summer vacations were for Mortimer so well occupied with house parties and travel that the promised cruise was forgotten.

After college Mortimer studied law. As a student of this profession, though of average thoroughness, he was more especially characterized by brilliance; he could take in the "headlines" of a subject quickly and well. After a short apprenticeship as a lawyer, he turned his attention to politics in which he made for himself a brilliant and successful career.

Evans took up research in physics as his life-work, and after a year in the great Cavendish Laboratory of Cambridge, England, he found a place in the physics department of one of the leading American universities. His researches dealt with the problems of atomic structure and dynamics, and in this work he was deeply absorbed, giving little time to anything else, except during his vacations when he made a point each year of taking a substantial allowance of outdoor life, usually cruising in a small sailboat along the New England coast and often as far as Nova Scotia or the Gulf of Saint Lawrence. Thus he kept the elasticity of youth, and with it an ever-increasing self-reliance, so that no problem presented to him by wind or tide or fog could catch him without adequate resource.

Three years after graduation the class of which Evans and Mortimer were members held a reunion at their Alma Mater in June. Mortimer, now as always the leader in his class, was the central figure, usually surrounded by groups of warm friends chatting about old times and war times, or discussing questions of the day. Once during the reunion he contrived to get off in a corner with Evans.

"What about that cruise we planned in London?" he said. "Six years have gone by and we don't seem to have pulled it off yet."

"Name your day this summer," said Evans, "and I'll take you on."

"I'm scheduled for a vacation the first of August. How would that suit you?"

"That suits me fine. My boat will be in the harbor; just come to my laboratory and we'll go aboard."

"That's a date," said Mortimer; "don't forget."

On August first Mortimer appeared at the Physics Building and asked for Evans. A crotchety *diener* in faded overalls showed him to a room in the basement far removed from the light of day. Within, the sight which met his eye was what appeared to be a hopeless snarl of junk. There was a maze of glass tubing bent into all sorts of bizarre shapes, some of it covered with crumpled bits of sheet lead or tinfoil from the wrapping of a cake of chocolate; there were wires leading every which way with no apparent vestige of order; there were old wooden packing-boxes serving as supports, rusty nails bent upward for hooks, nondescript objects tied together with twine or stuck together with wax. Yet within this crazy jumble were instruments whose construction required the highest refinement of manual skill that can be found in all the world. The entire set-up was the culmination of years of patient planning, designing, and assembling. Crude as it appeared, it was in reality the key to some of the profoundest secrets of Nature; and no man on earth save Evans knew how to use it. In the midst of this strange assortment of matter, Evans sat on an empty packing-box, his eye glued to the eye-piece of an optical instrument.

"Well, Jim, are you coming sailing?"

Before answering, Evans scribbled some figures on a scrap of paper. Then he turned to Mortimer.

"Good Lord, Sam, is it the first of August already? I'd clean lost track of time."

"That's what it is; and there's a fine sailing breeze."

"Sailing breeze or no, I can't knock off now. I've been sweating all summer to get this experiment going right, and it's going at last to the Queen's taste."

"Well, where do I come in? I've come all the way from New York to go cruising with you."

"I tell you what," said Evans, after a moment's reflection, "you go down to the harbor and find Jones's store. Get whatever looks good in the way of fresh food; I've got plenty of canned goods and staple groceries on board. Get the stuff delivered at Salter's Landing. I can finish up this experiment by midnight, and I guess after that it won't hurt me to get it out of my system for a while. Go to the movies or anything you like, and then come here with a taxi about midnight, and we'll get aboard as quick as we can."

Clearly the man of science could no more be budged till his cherished experiment had yielded its golden fruit of knowledge than can the moon be diverted from her course in the skies. No exploration of new continents, no searching for hidden gold can lure the spirit on with so strong an appeal as the unknown law of Nature awaiting the crucial experiment, planned and prepared for months, and then appearing at last like the light of day when the experiment is done and the measurements construed with the power of reason.

Mortimer obeyed, and wandered off to spend the afternoon and evening on the water-front of the harbor. The next day the two friends sailed a sparkling sea together in a tiny cruising knockabout — boys once more.

CHAPTER II

THE STORM-CLOUD

THE next act of our story opens in the year 1937. An international crisis of the most momentous nature had just come to a head in Europe.

For some years past a group of powerful men in Constantinople, intriguing diplomatists and financial magnates, had been quietly developing a scheme for world domination. By a process of peaceful penetration, aided liberally by the adroit use of secret agents, they had obtained complete control of the Balkan Peninsula and Asia Minor, and for the first time in history reaped the harvest of a proper development of the rich natural resources of these areas. Thus enriched, the coalition had spread its tentacles all around the Mediterranean till it held Italy and Spain firmly in its grip; and yet by respecting the nominal independence of these countries the power which it had over them was cleverly concealed from the world.

Much of Russia was entangled in the snare. Being once more promised a realization of the fools' dream of communism, the adherents of Bolshevism were won over into an alliance. By propaganda promising the dawn of a new day of freedom, the enthusiastic support of the peasants, long oppressed by the sinister strangle-hold of the Soviets, was enlisted in behalf of the new combination.

The old Pan-Islam spirit of the Moslems was vigorously exploited, and thus a powerful underlying motive force was brought to bear on the furtherance of the scheme.

A substantial Turkish navy was built, and with money

furnished by the coalition, Greece, Italy, and Spain were encouraged to build strong navies, too. No one of these navies was big enough to excite much suspicion in England or America, and no one but the coalition and its secret agents knew that these three navies were planned with a view to forming parts of one great whole. With diabolical cunning the gigantic plot against the world had been laid, and no exigency had been overlooked. Then suddenly in the early summer of 1937, the fruits of this vast intrigue appeared. Italy and Spain found themselves committed to an alliance with Constantinople with a view to obtaining complete control of the Mediterranean Sea. Through the work of a body of spies, unique in preparedness and efficiency, France suddenly found her Mediterranean fleet paralyzed, and before she could make a move to defend them, her ships were seized without a blow. With astonishing rapidity the various navies, thus reinforced, were mobilized and operated as a coördinated fleet. England had but few ships in the Mediterranean at the time, and these were soon engaged in battle by overwhelming numbers, and sunk, after putting up the stiffest resistance imaginable against fearful odds. Then Malta and Egypt were attacked and seized. The south coast of France was occupied with an invading force; all important points on the north coast of Africa were taken, and the control of the Mediterranean became complete, with the exception of Gibraltar.

The British Navy was rushed to the defense of this stronghold, and had they passed the strait a naval action would have ensued which might have saved Europe then and there from the specter of the new Byzantine Empire. But this exigency, like others, had been anticipated. As the great navy steamed into the straits, supposedly under

the protection of Gibraltar, a vast battery of sixteen-inch guns mounted on railway cars opened a withering fire from the Spanish shore at Tarifa. Less than half of the capital ships passed through this barrage, and most of those, before they were well out of range, ran into a mine-field stretching across the strait, laid at night some weeks before by enemy submarines and made ready for action by wire from Tarifa as the fleet approached.

A handful of battleships, cruisers, and destroyers escaped the trap, and bravely faced their fate in the defense of Gibraltar. But the waiting enemy had now such an overwhelming advantage in numbers that their doom was sealed. Cut off by land and sea, it was of course only a matter of time before Gibraltar fell.

And now England was left with her mighty navy gone, all but the few ships that were in dry-dock and couldn't be sent in time, and a few obsolete vessels purposely left at home.

All Northern Europe rose to fight the Constantinople Coalition. England, France, Belgium, Holland, Germany, Poland, and the Scandinavian nations placed troops in the field. And soon two giant armies faced each other entrenched in a battle-line extending from the Pyrenees to the Alps and thence along mountain barriers where such existed, eastward to the Caspian Sea. In the development of land warfare, defensive measures had outstripped offensive measures, and especially strong were the defensive methods used by the Mediterranean forces. Consequently ground could be gained by the northern armies only at the cost of prohibitive losses. A military deadlock ensued, and the problem became one of attrition. In natural resources in the Eastern Hemisphere the Mediterranean group had slightly the better situation, but what counted still more

was control of the Atlantic Ocean, and through it, access to the resources of the Western Hemisphere.

This control by the Mediterranean Powers being undisputed, virtually all commerce between North America and Northern Europe was cut off. The resources of Northern Europe sufficed to maintain the war for the present, but clearly materials from the Western Hemisphere would in time be a necessity if the war was to go on.

Through the summer months America maintained neutrality, although it was daily becoming clearer to those whose vision extended beyond the balance-sheet of the current month that, as in 1917, civilization was at stake, and the sooner America shouldered her share of the fight the better it would be for all the world, herself included.

This was the situation when on a warm sunny morning in September one of America's newest destroyers crossed Cape Cod Bay at a thirty-knot speed, and, gliding smoothly into Provincetown Harbor, dropped anchor. As the chain rattled down, a tall, well-built man in civilian clothes stood on the bridge beside the skipper and surveyed the harbor. Presently his eye rested on a small sailboat, ketch-rigged, of some thirty-six feet over-all length, making toward them about a quarter of a mile away.

"I guess that's my boat, skipper," said the civilian.

"Going round the Cape in that, are you? She's not over-roomy, but she looks like a good sea boat," was the answer.

A boat was lowered; the civilian left the bridge, shook hands with the skipper, and was soon on his way toward the sailboat which presently shot up into the wind and, with her sails flapping, gradually lost headway as the motor-boat from the destroyer came up on her starboard quarter. The passenger clambered over the side and into the cockpit of the little ketch, a sailor handed him his suit-

case, and with a parting word of thanks to the crew of the motor-boat he sat down to look about him.

At the wheel was a man not over middle height, compact and strong-looking, with a clear, ruddy complexion, dressed in a pair of khaki trousers and gray flannel shirt, a striking contrast to the officers of the destroyer. The new skipper wasted no time in greetings, but with eyes intent on the movements of the motor-boat just shoving off, reached for the starboard jib sheet, pulled it in and held it till the sailboat payed off to port and gathered steerageway. Then, trimming the jib over, he settled back comfortably and said, "Well, how are you? Had a nice trip across the Bay, didn't you?"

"Beautiful; those destroyers glide along like a dream. This is a cozy little boat you've got, Jim; where's your crew?"

"You're my crew to-day," said the skipper. "Lord! I don't want a crew killing time about the deck. That's the advantage of this size and rig; I can handle her alone, and yet she's big enough for comfortable cruising, and safe in any sea there is. I couldn't afford a crew if I wanted one; so I'm glad I don't. Take your valise below and have a look round, don't you want to? Take the port bunk, my gear's on the starboard."

His friend acted on the suggestion and with a landsman's clumsiness engineered himself and his valise down the hatch into the coziest, snuggest little cabin he had ever seen. Presently he returned to the cockpit.

"Looks like a nice little place to duck in out of the wet."

"It is rather a nice little cabin," said the skipper. "To tell the truth, this boat just suits me, and I feel as much at home on her as I do anywhere in the world. I used to fancy something fast and racy as my ideal of a sailboat, but as I

get older I incline more to this sort of thing, seaworthy and comfortable, fit to ride out any gale that blows."

"You don't look so awfully old yet," said the other.

"I don't suppose I do," said the skipper, "but if I remember rightly I'm only a year younger than you."

"That's so," said the other. "I'm forty, and they tell me I look five years older than I am. But you don't look any older than you did in college."

"I'm generally supposed to be still in the twenties. I judge that my sheltered and quiet existence in the laboratory, together with lots of outdoor life, camping, cruising, etc., has kept me young, while battling with the storms of a busy world has been ageing you."

The skipper of the sailboat was Jim Evans; his passenger, Sam Mortimer. Through the years since college their friendship had endured, yet their lives led them so far apart that they seldom came together. Evans's career as a scientist had brought him happiness, but no fame. His reputation for work of the highest quality was known only to a handful of experts competent to judge.

Mortimer's career in politics had, on the other hand, placed him increasingly in the limelight, till in the spring of 1937 he found himself shouldering no less a responsibility than that of Secretary of the Navy, just as the European crisis was coming to a head. His predecessor had been none too competent, and in consequence his six months in office had been almost wholly taken up with reorganization in the Department, and little time had been left him to study the principles of naval policy, strategy, and tactics. His knowledge of naval affairs was small, and indeed he knew little of seafaring lore in any form. In years gone by he had made one or two short cruises in a small boat with Evans, but since then his recreations had been

golf and tennis, and all his professional attention had been focussed on politics. As yet no action had been taken by the American Government toward joining in the war, and the public had little idea whether any was to be expected; but to the Cabinet it was evident that action must come soon. Now Mortimer was keenly aware that the question of naval control of the Atlantic Ocean would soon be resting on his shoulders more directly than on those of any other man living; small wonder, then, that he felt overwhelmed by the responsibility he saw approaching. The American Navy was large and powerful, and, reinforced by such French ships as had been outside the Mediterranean and such British ships as had escaped disaster, it was about an even match for the consolidated navy of the Mediterranean Powers. On its efficiency rested the control of the Atlantic.

Early in September Secretary Mortimer left Washington for Boston to spend three days examining the resources of the First Naval District. He had spent a harassed and busy summer struggling to get the navy ready for the task which each week made it seem more probable was to devolve upon it. Every week the consciousness of his inability to see with an expert's eye the large problems of naval strategy distressed him more. His brain was in a whirl, and he felt that he must for one day at least get off and give himself over to relaxation.

In this crisis the old desire to see Evans came over him; the sense of reliance on his friend, though often forgotten, was still there. He had telegraphed Evans asking if he could spare a day when they might get off by themselves and have a good talk. Evans had replied, suggesting a sail round Cape Cod as the most complete escape from the interruptions which would pursue them were they to re-

main in the haunts of men. Evans had his boat at Provincetown, and Mortimer, on completing his business in Boston, boarded a destroyer at the Navy Yard in the early morning and joined his friend in time to make a good start round the Cape.

The wind was west, and a little beating to windward brought the boat clear of Provincetown Harbor and around Race Point, where they started their sheets, then jibed and began the long reach down the Cape, by Highland Light, keeping close in shore where the sandy and pebbly beach and the bluffs behind presented a pleasing if somewhat monotonous picture.

As these two stanch friends sat chatting together in the cockpit of the *Petrel*, as Evans called his boat, dropping Highland Light astern and picking up Nauset, their talk drifted toward the topic that was harassing Mortimer by day and night.

“How much have you kept up with navy affairs since you left the service after the war?” he asked of Evans.

“Enough to know that the engineering men of the service have made wonderful strides in development in various fields, especially in communications, opening possibilities undreamed of in 1918, and that through the perennial difficulties of personnel, these developments are not utilized to anything like the extent they might be. To tell the truth, the navy has always interested me intensely; it has been a hobby of mine to read Mahan and other standard writers during my spare time, as well as the Naval Institute Proceedings. I’ve also kept in touch with some of the radio men I knew in the war who have stayed in the service, and I have watched with great interest the progress in radio communication that has taken place.”

“My God, I wish I had your knowledge of the subject,”

said Mortimer. "Law and politics have taught me some things, but they haven't taught me the principles of naval policy and naval operations, and those are the things I want to know now.

"I suppose you realize," he went on, "that we may not be able to stay out of the European vortex much longer."

"On the face of it," answered Evans, "I should say we were due in it right now. I haven't heard the 'inside dope,' but I can't conceive of our staying out much longer, all things considered."

"Well, I trust your discretion enough to say that you have sized it up about right. There won't be many weeks more of neutrality; and then a big load comes on our Department."

"I should say it was a clear case," said Evans, "that the whole game hung on our navy. While the enemy keep their fleet intact and maintain the complete control of the Mediterranean, the Northern armies can never score a decisive victory; and if the Turks are left in control of the Atlantic the attrition will all come on our side. We must establish and keep up a steady flow of supplies from both North and South America to maintain even the present status; and we must destroy their navy to win the war."

Thus the conversation progressed to a discussion of the basic principles of naval policy and strategy, in which Mortimer, as more than once before, found himself marveling at Evans's clearness and breadth of vision. None of the admirals at the heads of bureaus in Washington had seemed able to see things in so large a perspective; none had helped him to grasp the fundamental principles of the problem before him as this man, trained in science, yet versed in naval affairs as well.

The small cabin clock struck two-bells.

"Let's have some lunch, Sam," said Evans. "Take the wheel, steer as you're going, due south, while I get the stuff out."

He disappeared down the hatch with the nimbleness of a boy in his teens, and began to prepare a simple lunch over an alcohol stove. As Mortimer sat at the wheel with the warm wind off the Cape Cod shore fanning his cheek, he pondered over this simple child of Nature, to all appearances a college boy on a vacation, whose characterization of the crisis offered so much food for thought.

Soon Evans reappeared in the cockpit with an appetizing meal which they ate in camp style, Evans steering and eating at the same time, not appreciably to the detriment of either task. Again he left Mortimer at the wheel while he addressed himself to the task of cleaning up. When next he came on deck, he found Mortimer manifestly drowsy and a good two points off the course. The warm shore wind, the peace and quiet and the relaxation from constant strain, conspired to overcome him. Evans reached below for a pillow and placed it on the lee side.

"Here, stretch out on the cockpit seat and take a good nap," he said.

Mortimer relinquished the wheel, and soon was fast asleep.

When next he waked the afternoon was well advanced. The air felt rather close and muggy, and so hazy was it that the sun shone dimly, and the land, only three or four miles away, was scarcely visible.

"Where are we?" he asked.

"There's Chatham nearly abeam," said Evans. "The barometer's falling; I think we may get a squall."

"Your boat will stand it, I trust?"

"She'll stand it, all right," said Evans with a laugh.

"She'll stand anything that blows. The only practical question is whether to take the short cut between Bearse Shoal and Monomoy. It saves two or three miles, and if it's going to be rotten weather it'll be more comfortable for old men like us to get into some sheltered water before dark."

"What is there against the short cut?"

"Well, if it should get thick with rain it would be a little hard to see where we were, and there are shoals on both sides; also it's all so shoal there that a heavy squall from the northeast would kick up an infernal rip with the tide running the way it will be when we get there. But then, a rip can't hurt us unless it's bad enough to let her touch bottom in the trough, and it would take a first-class hurricane to do that."

"Well, all I ask is that you avoid a serious shipwreck, for I've responsibilities ahead that I really ought not to sidestep."

"You can trust the *Petrel* to get you through," said Evans.

"Not to mention her skipper," answered Mortimer.

Still the west wind held and the little boat stood on till Chatham was on the starboard quarter and no longer visible through the haze. The air still felt warm and heavy; in the northeast, through the haze, dark clouds could be dimly seen gathering. Evans trimmed in his sheets and luffed toward the point of Monomoy. Pollock Rip Slue Lightship was visible, and on that Evans took a careful bearing and wrote it down, together with the time. Monomoy could barely be seen as a faint white line of sand to the westward. No landmark there could be identified, but Evans noted the bearings of as much of it as he could see, then studied the chart. He took a look round at the sky, left the wheel, and glanced at the barometer.

"Glass is falling fast," he said. "Take the wheel a minute while I put on rubber boots and oilers; then you can do the same."

He dived below and soon came up dressed in oilskins and sou'wester, took the wheel, and sent Mortimer down to put on his spare set. Suddenly a chill wind struck from the northeast; the sails went over and fetched up on the sheets to starboard.

"What's up?" called Mortimer from below.

"Wind's shifted; nothing much yet," answered Evans as he trimmed over the jib and slacked the main sheet.

Mortimer came on deck. Evans was looking now at the compass and now at the clouds in the northeast, already looking murky and ominous.

"I'm heading for that short cut," said Evans. "I could still go out round Pollock Rip, but it would waste a lot of time and we'll be all right in here. I know where we are well enough to hit the channel; if it blows hard the rip will be rather sensational at the shallowest point, but won't do us any harm. She's built so strong that even if she did touch the sand in the trough of a wave, it wouldn't hurt her."

The wind was now blowing freshly from the northeast and the *Petrel* was driving along before it at a good speed.

"Isn't it about time to reef?" asked Mortimer.

"We shan't need to. That's the beauty of this rig; you can shorten sail to your heart's content without reefing."

The clouds grew darker and the wind increased till white-caps appeared and dotted the sea, and the little boat sped on before it with increasing speed.

"Time to get in the mainsail," said Evans; "take the wheel; steer southwest by west, and hold your course as close as you know how."

Then he let go the halyards, and running forward with a couple of stops in his hand, had the sail down and roughly furled in a few seconds.

"Now," he said, taking the wheel again, "she'll stand a whole lot of wind this way. Hold the chart for me. This channel isn't buoyed, and the chart helps."

Even with only the mizzen and jib the *Petrel* made good speed; and now with the stiff wind and east-running tide, the whitecaps were increasing to good-sized breakers. Then the dark clouds to windward gathered themselves into a huge black knot, black as ink and roughly funnel-shaped. Like a giant projectile this black mass approached, coming at an astounding speed.

"This is going to be a good one," said Evans. "It'll be thick in a minute, I wouldn't mind seeing a landmark ahead. Ah! there's Monomoy Light."

Straining his eyes he could barely make out the lighthouse and get an approximate bearing on it. But Mortimer's eyes were riveted on the colossal black storm-cloud whirling through space toward him in a way that fairly took his breath away.

"The jib's all we'll want when this hits," said Evans, and in another second or two he had the mizzen down and a stop around it.

And then the thing struck. So violent was the blow that it seemed as if the boat might be lifted from the water and carried through space. The air was full of flying water — sheets of spray blown from the tops of the waves, while overhead a darkness almost like the night closed in. Rain came driving horizontally in sheets, and lightning flashed round half the horizon. It was impossible to see a quarter of a mile.

Mortimer looked at Evans whose eyes scarcely left the



AND THEN THE THING STRUCK

compass, and saw in his face alertness, steadiness, and strength; and the fear which such an overwhelming outburst of the fury of the elements had naturally aroused in him was effectually quelled.

Almost as quickly as it had come the black cloud blew over, leaving a sense of dazzling brightness by contrast, although the sky was still heavily clouded. For three or four minutes the wind blew with almost unabated fury, the little boat scudding bravely before it under her jib. Then the wind moderated enough to relax the tension, but still blew hard enough to make them glad of shortened sail.

"Eighty miles an hour, I'll bet, during the height of that," said Evans. "All of forty, still."

And now the waves had become high and steep and short.

"We're getting into that tide rip I spoke of; the water's getting shoal. The sand's so white it looks shoaler than it really is."

Mortimer looked ahead and saw through the rain great whitecaps forming an almost solid line like the breakers on a beach, and in the troughs of the waves the white sand bottom gleamed alarmingly near.

"Lord! are we going into that?" he asked.

"She won't touch, and the waves can't hurt her. They may come aboard now and then, but they'll drain right out through the cockpit scuppers. You might close the cabin hatch."

The waves grew higher and steeper, and now they were in a mass of breaking whitecaps. Each wave lifted the little boat up, and with her nose deep down in the trough, she would dash forward with amazing speed till the wave broke all around her and she came to a stop in a smother of foam. Looking back, it often seemed as though the waves, towering high and curling over the stern, would swamp the

boat completely, but each time the stern rose gracefully, and at most a few gallons of water would splash into the cockpit.

"I didn't suppose any boat could live in this," said Mortimer.

"It sometimes surprises me to see how well she rides these things," answered Evans. "I'd like to see that lighthouse again to make sure we're in the channel. We should in a minute, as the rain's letting up, and we're getting near to it. There it is. We'll be through most of it in a minute now."

Then, with series of plunges, in each of which it seemed as if she must drive her bow into the white sand, so close below the surface it appeared, the *Petrel* passed through the roaring breakers into the deeper water beyond, where, rough as it was, it seemed like a haven of refuge compared with the rip they had come through.

Mortimer breathed more freely. "I don't mind saying I felt scared coming through that," he said. "I'm glad you know this game as well as you do."

"I'm not sorry to be through it myself," said Evans. "It was quite rough enough for a bit. I don't think I ever saw such an ugly squall, and I've seen some bad ones. Still, as long as I had that bearing on Monomoy Light we were in no danger. Quarter of a mile out of the channel, it's so shoal she might have hit."

"What would you have done if you hadn't got that bearing?"

"I guess I'd have stood off and waited till it cleared enough to see the lighthouse, or else beat out round Bearse Shoal, and that would have been a hell of a rough thrash to windward; still, it wouldn't have hurt us any."

"It looks to me as if the gods had a way of fighting on

your side," said Mortimer. "Do you always get away with it when you take a chance like that?"

Evans looked serious. "I don't know as I can claim that," he said, "but Fortune has been pretty good to me in her own way. Maybe I was rather foolish to go through that. It will be smoother from now on; there'll be some small rips, but nothing like that one. I think we'd better make for Hyannis. We could anchor in Chatham Roads, but that would be exposed if the wind turned southwest. Hyannis is a good harbor in any wind, and it will be easy getting in after dark with Bishop and Clerk's and the harbor range lights to steer by. It'll be handier for you in the morning, too. Take her while I hoist the mizzen; we may as well have that now."

In another minute the little boat was speeding on before the gale under mizzen and jib. The rain had subsided, but a leaden twilight was closing in. Monomoy appeared as a low white streak of sand on the starboard beam. Hugging it close, they rounded Monomoy Point and luffed to clear the north end of Handkerchief Shoal. Evans went below and lit the running lights, then, starting a fire in the small coal stove in the galley, put some potatoes and rice on to boil. Then he came on deck with some pilot biscuit and chocolate, and the two friends settled down in the snug little cockpit to enjoy their sail through the shoals in the gathering darkness.

Soon their talk drifted back to the all-important topic of the coming crisis.

"It always seemed to me," said Evans, "that a navy could conveniently be likened to a living organism, a man, for instance. A man has senses — sight, hearing, etc. — which tell him what's happening about him. Nerves carry the impressions from the sense organs to the central station,

the brain, where information is sorted into the springs of action; other nerves carry messages from the brain to the muscles that work the arms and legs — and incidentally the teeth. Now in the navy your patrols, scouts, planes, drifters, etc., with their observers and hydrophones, and all forms of radio receiving apparatus, are the senses, and I should include under that head, spies. In place of the muscles, fists, and teeth you have the ships' engines and the guns, torpedoes, bombs, and such like. The nervous system is the general staff which determines policy, the admirals who execute it, and communications which are the nerves that bring information into the navy's brain, and in turn give the word for action. Communications, of course, comprise flag signals, blinkers, semaphores, couriers, postal service, telephones, telegraph, radio, and the newer methods, such as infra-red rays.

“Now it seems to me the importance of communications hasn't been emphasized half enough. The methods available are highly developed, but their value isn't clearly enough appreciated. You can hardly find a finer, keener, better-trained bunch of men anywhere than the officers of our navy, but the profession has grown so complex and the duties to be learned so manifold that it takes an exceptional man to grasp all the possibilities science has developed and to see them in a proper perspective. The average naval officer takes far more interest in ordnance and gunnery than he does in communications. The difference between an athlete and a lummo is not in the muscles, but in the nervous system which coördinates their action. Provided the muscles are not atrophied or diseased, they'll do what the nerves tell 'em to. Now gunnery is obviously important — so obviously that the personnel tends to look on it as the whole thing. Of course it must be efficient, but it has been

ever since Sims made it so; it must be kept up to the mark, but it is a strong tradition in the navy to keep it so, and I don't think you'll have any trouble on that score. It is intelligence and coördination, and communication in particular that you must look out for in order to make your fighting strength effective. Just as the skill and wisdom of the gunnery officer direct the titanic force of the guns to the point where it is most telling, so the controlling mind, acting through communications, directs the force of the entire fleet; that's the field where the minimum energy will yield the largest return; put your best efforts in there."

"Don't forget morale," said Mortimer.

"Quite right," said Evans; "morale is more than half the fight; without it no amount of skill or intelligence will avail; but without the aid of the mind morale is flung helpless at the mercy of superior skill in an opponent. I am inclined to assume morale; and I believe it is a justified assumption, for to stress and foster it is a tradition well maintained in our service."

Evans went on to explain to Mortimer some of the methods of communication which had been developed: the internal communications in a ship, the dual use of a single antenna to receive two messages simultaneously on different wave lengths, the use of infra-red rays for secret messages between ships in a fleet, and many other things which Mortimer had never had time to learn.

"I wish I could make you Director of Naval Communications," said Mortimer. "Unfortunately the rank that goes with that position is rear admiral. Under the existing regulations the highest rank I could give you is lieutenant-commander. If you were a captain, I could make you a temporary rear admiral in order to hold that position, but I don't know of any way that it could be done straight from civil life."

"If I were you I wouldn't try to make me an admiral or even a lieutenant-commander," answered Evans. "Professional naval officers are apt to resent having men out of civil life put over them with superior naval rank. They'd feel that I was 'striped way up,' even as lieutenant-commander, and that I hadn't earned my rank. I should encounter friction and difficulties in consequence. I sure want to help you in any capacity I can, but my suggestion is that you make me a warrant officer, say radio gunner."

"Radio gunner!" exclaimed Mortimer; "that's a pretty small job for you. You'd be subordinate to a lot of ensigns just out of Annapolis."

"It's not necessarily such a small job; officers of high rank are apt to heed the advice of a dependable warrant officer, regarding him as a technical expert. Often they respect a warrant officer who knows his business a good deal more than they do ensigns and lieutenants. If he works his opportunities right, he may put over more than purely technical ideas. A man who doesn't use his opportunities right won't get very far in warfare though he wears the gold braid of an admiral."

The night had closed in dark as pitch, and the wind swept on furiously from the stormy sky. Evans steered his little boat over the waves, guided by the familiar lights in the distance. To the south the lights of a tow of barges and a coasting schooner, threading the ship channel through the shoals, grew dimmer and finally were lost in the murk.

The conversation drifted on to the question of the use of scientists in war. Evans summed up his views on this point as follows:

"Make free use of scientists, but use them with skill. A scientist in war, if he hasn't engineering sense as well as scientific spirit, is apt to be like a drunken man trying to

make a speech; his mind is so discursive he can never get to the point. In peace the best measure of a scientist's merit is the patience with which he can seek truth for its own sake, and his indifference to the application of his work to tangible results. In war this point of view is out of season; the man's value then depends on his impatience to apply all he knows to getting results of the most tangible kind. At the dinner hour we sit down to eat our food and digest it; the dinner hour over, eating becomes unseasonable, and we must absorb what we have eaten and utilize it in the performance of the day's work.

"In the war with Germany a vast amount of time was wasted by scientists who couldn't adapt their points of view to war-time conditions. They insisted on laying their foundations with the same painstaking thoroughness and patience with which they would pave the way to a new theory of light; they kept before them the same ideal of perfection which the highest standards of peace-time scholarship demand. The Armistice found them still laying their foundations, and their efforts all wasted, as far as winning the war was concerned. Of course it pays to keep some fundamental work going on the chance of the war lasting a good many years, but there's such a thing as sense of proportion about it; and that's what lots of scientists lack."

"How is the non-scientific head of a big department to know whether a line of research promises to bring results in a finite time or not?" asked Mortimer.

"That's difficult," said Evans. "The best thing is to have on hand some men of large caliber whom you can trust to have engineering sense as well as scientific vision, and make them keep the others in the paths of reason."

Among other things Evans pointed out the great importance of weather forecasting in naval warfare.

"It doesn't take much imagination to see that it might come in handy to know a little beforehand when something like what hit us to-day is coming. Imagine trying to carry out some kinds of naval operations during the worst of that squall. Then the direction of the wind may affect the visibility in different directions, so as to make it a decisive factor in a naval action."

"Weather prediction is still pretty much a matter of guesswork, isn't it?" asked Mortimer.

"No, there's a good deal of science to it," said Evans, "and there's more coming to fruition than is generally known. Professor Jeremy is probably the ablest meteorologist in the world. He has been doing some wonderful research on the causes of weather changes, and I believe he's in a way to reach some very important conclusions before long. You couldn't do better than put him in charge of your Naval Weather Service, with a free hand to do things his own way. He'd have a sense of proportion, and go at the most practical kind of research which would in a few months give our navy so much better knowledge of weather prediction than the enemy as to be a really important military advantage. Then the trouble would be to make the admirals appreciate what they had, and use it."

They had now crossed the open sheet of water between Monomoy and Point Gammon, and had passed Bishop and Clerk's lighthouse a mile to leeward, till it was already receding on the port quarter. The outline of Point Gammon showed dimly to windward. Taking a bearing on Hyannisport Light, Evans luffed and trimmed in the sheets a bit. Soon they were in the lee of Point Gammon where the water was smoother, and steering north-northwest picked up the spindle on Great Rock on the weather bow. Passing this they luffed close on the wind till they sighted the break-

water to leeward just before they brought the range lights in line. Inside the breakwater, Evans kept off and steered for the lights in the cottages that line the harbor shore, while the dark line of the land ahead loomed nearer and nearer, and its outline grew more distinct. The riding lights of some of the larger boats at anchor were now quite distinguishable from the cottage lights beyond. Evans went forward, cleared the anchor, and hauled down the jib, then returning to the wheel he picked his way in past some of the larger vessels to a snug anchorage near a group of Cape Cod catboats. The gale was still blowing hard and showed no signs of moderating, so he let go both anchors and gave them a generous allowance of scope. He made all snug on deck in spite of the darkness, with an alacrity born of long experience and the most intimate familiarity with every rope and cleat on his boat; then put up the riding light. With a careful look around he went aft into the cockpit, saying:

“Well, we’re all snug here. The holding ground’s good, so it can blow all it’s a mind to, and we shan’t drag. Let’s go below, get out of these wet oilers, and have something to eat.”

The hour was late for supper — a fact which did not militate against their appetites. In the cabin there was warmth from the little galley stove where the potatoes and rice were now done. Evans opened a tin of canned chicken and stirred the contents into the rice.

“Supper’s ready,” he said, putting some plates and bread on the table. “This chicken-rice mixture is about the easiest thing to get ready on a rough day, and it makes a pretty good meal in itself.”

They fell to like a pair of wolves, and Mortimer declared he had never found a meal more to his liking.

After supper Evans tumbled the *débris* into a big dishpan and began a hasty but effective dish-washing.

"Can I help?" asked Mortimer.

"You can wipe," answered Evans, and tossed him a dish towel.

Before turning in, Evans took another look at the weather which still showed no signs of changing, and then the tired men took to their bunks, and darkness reigned in the little cabin except for a glimmer from the riding light through a porthole forward.

Tired as he was, it was some time before Mortimer fell asleep. The excitement of the squall and the novelty of his surroundings kept him awake, listening to the wind shrieking in the rigging. But the gentle rocking of the boat in her sheltered anchorage lulled him off at last to a deep sleep.

Next morning he waked to hear Evans shaking the ashes out of the galley stove. The wind had moderated and the sky showed signs of clearing. After a plunge overboard and a good breakfast, Mortimer felt better than he had for months. Evans rowed him ashore in his dinghy in time to catch the train, and before they parted it was settled that Evans should go to Washington in a fortnight's time and be enrolled as a radio gunner in the navy.

Evans took advantage of the northeast wind which was still blowing strong to make the run to New Bedford. With a single-reefed mainsail, for comfort in handling, as he was alone, he made the run through Wood's Hole and across Buzzard's Bay in six hours or so, and dropped anchor in New Bedford Harbor some time before sunset. As he sailed across the bay he pondered the problem confronting his friend.

"It's strange," he said to himself, "on what capricious things the great affairs of the world sometimes depend.

But Sam will make good, even if he does seem to know less about the navy than I do. He's able, he's dead in earnest, and he's open-minded; damn few secretaries have been more than that."

He racked his brains to think how he could help his friend, and in his mind there grew the framework of a strong organization of engineering men so mobilized as to place at the disposal of the navy the efficient use of the best that science could offer.

At New Bedford he arranged to have his boat hauled out for the winter.

"I don't expect to put her in commission next summer," he said to the man at the shipyard; "you'd better be prepared to store her for a second winter."

CHAPTER III

THE MOBILIZATION

EARLY in October, about four weeks after Mortimer's sail around Cape Cod with Evans, the United States declared war against the Constantinople Coalition, otherwise known as "The Mediterranean Powers."

Like a great conflagration, a new wave of idealism swept over the land. To every one was offered the opportunity to come forward and give the best that was in him, and few but accepted it gladly.

Washington became the scene of turmoil. Flocks of people poured in. The "swivel-chair warrior" reappeared in all his glory, and the "efficiency expert" added the finishing touch to the orgy of organization and reorganization in which the War Department became engulfed.

In the Navy Department a comparative quiet reigned; the atmosphere was almost that of an efficiently organized and smoothly running business. Until two or three days before the declaration of war Secretary Mortimer was daily in conference for an hour or more with a certain civilian, but so large was the department and so many were the new faces that no one noticed him to be the same individual as the warrant officer, Radio Gunner Evans, who, the day before war was declared, was assigned to duty in the Radio Division of the Bureau of Engineering. Here Evans was given a room to himself. On his desk were two telephones, one connected with the department exchange, the other with the Secretary's room by a special wire. Evans had himself completed the laying of these wires into his own

room and made the terminal connection with the telephone on his desk. No one but he and Mortimer knew where this line led.

Nominally Evans's duty was the direction and supervision of a group of civilian experts engaged in designing new radio apparatus for installation on ships and shore stations. He was also frequently seen at the office of the Director of Naval Communications.

It behooves the personnel of this office to coöperate cordially with the personnel of the Bureau of Engineering, since the latter makes the apparatus for the former to use, though some people don't understand this fact. In general, the personnel of the D.N.C. office did not know why this warrant officer should appear from time to time, and some said, "Who's this guy, anyway, and what's he doing round here?"

To which query the answer was, as like as not, "Dunno; maybe he's using this office as an alibi for dodging his work where he belongs."

Before a state of war had existed two days, letters had been received from Mortimer by half a dozen of the best radio engineers in the country and a number of eminent investigators in various fields of physical science, asking them to come to Washington to confer with him. Within a week nearly all of these men had come, and a comprehensive plan had been laid for the coöperative work whereby their brains could be utilized to the best advantage of the navy. At these conferences Commander Rich, head of the Radio Division of the Bureau of Engineering, was present, and the impression which he made on the scientists for his rapid grasp of what was essential in the great problem before them was such that more than one took occasion to congratulate Mortimer on having such a man in his

organization, especially on having him in charge of so important a branch of the service as radio. About this time, also, Professor Jeremy, with rank of lieutenant-commander, was placed in charge of the naval weather service, and with a group of able young assistants began to attack his problem with energy and resource.

The public mind turned rather to the army than to the navy; to most people entry into the war meant the sending of troops to reinforce the armies of Northern Europe in the line of trenches stretching across the continent; the thought of the happenings on the sea scarcely figured in their minds. The popular hue and cry was, "Join the Army." Congress began agitating the question of conscription for the army. But the navy needed enormous additions to its personnel.

Mortimer paid a visit to the Bureau of Engineering and, after discussing progress with the Bureau Chief and Commander Rich, he slipped into Evans's room to discuss matters with him.

"It looks as if this conscription business might fill up the army and leave the navy high and dry," he said. "I don't think Congress understands that the main task is up to the navy, and we've got to have men to do it."

"People don't understand that, as a rule," answered Evans. "They look at the battle-line across Europe, and think that's the war. They don't understand that the war can be carried on only by means of certain commodities some of which can be produced only in the Western Hemisphere; that the vast resources of South America are of vital importance to whichever side controls them; that the control of the sea has thus far given the enemy access to these resources and denied it to our allies; and that the one way to checkmate them is to secure complete control of the seas for ourselves. Welcome as our army would be to rein-

force those of Northern Europe, even if we got it safely across, it could do nothing decisive against the present defensive methods in use along the enemy's line. No, the game is up to us; you're dead right, we've got to have our share of the men."

"I believe the President could do something about it by executive action," said Mortimer. "But I'm not sure if he's quite alive to the importance of the navy himself. Military affairs are not his long suit. If I urge on him the importance of it, the danger is that, unless I can give him convincing reasons, he may assume that it's just the usual thing — each man wants his own particular show to be the biggest. I want to get the essential points down in convincing and unanswerable form, and I'd like to have you help me prepare the case."

Evans then enumerated the salient points, indicating wherein the problem devolved upon the navy, while Mortimer questioned him and took notes. Evans showed how, through the progress of science and invention during the last twenty years, new methods had become available in warfare, and how the devilish cunning of the Constantinople plotters had utilized these and had taken advantage of their maritime control of the Mediterranean to establish a powerful grip on the south of France and make their defenses virtually impregnable, new inventions in offensive warfare having been more than countered by new methods of defense. He then enumerated the raw materials essential to maintaining the intricate structure of their military system and showed how a large percentage of these could be got only from the tropical regions of the Western Hemisphere — South America, Central America, and the West Indies. During the summer, when they held undisputed control of the Atlantic, the enemy had been transporting

enormous stores of those things which they most needed across from Brazil. Now that the American Navy had entered the field to dispute the control of the Atlantic, it became a question of naval power which side should keep its own source of supplies open and cut off that of the opponents.

The enemy now had control of Portugal, the Azores, Madeira, Teneriffe, and the Cape Verde Islands, and, with submarine and seaplane bases at Lisbon and the islands, they were continuing to harass the shipping in the North Atlantic in defiance of international law. Furthermore, under protection from these bases they could maintain an almost uninterrupted flow of commerce with South America, their ships passing close to the African coast where American surface craft could not safely attack them.

During their conversation Evans revealed a knowledge of raw materials, their places of origin and their uses, at which Mortimer was amazed.

"I don't see how you ever learned and remembered all these facts," he said.

"I forget lots of things I hear," answered Evans, "but these facts are so relevant to the crisis at hand that I had good reason to remember them. After all, the facts are open to any one; it's just a matter of taking the trouble to put them together and see what they mean."

In discussing the submarine situation, Evans urged the importance of getting possession of the Azores as soon as possible. He believed that a blow struck with the entire naval strength available would encounter no very serious opposition from the enemy.

"My guess is that, much as they want to keep the Azores, they are so much keener about keeping their navy intact and holding their control of the Mediterranean that they

wouldn't risk their fleet in a major naval action for the sake of the islands. Of course, we must first effect a consolidation of our fleet with what's left of the British and French navies, in order to have the maximum strength available."

"That's one of the first things we've got to get after," said Mortimer. "Well, first of all there's this matter of personnel to start right, and I must be about it. Many thanks for these points you've given me; they'll come in handy." With that he left the room.

The next day Evans was called by Mortimer on the telephone connected directly with the Secretary's room. The President had listened attentively to his recital of cogent facts and had been much impressed. He was almost certain the draft bill would go through, and had virtually assured Mortimer that the navy would not suffer in the choice of men.

Not many days passed before Evans and Mortimer were again closeted together discussing the coördination of naval effort. The British Navy was still able, in spite of the disaster, to furnish an appreciable addition to the force, and, above all, to furnish the wisdom and indomitable spirit bred of centuries of maritime greatness. Coöperation with it was now in Mortimer's mind as a foremost consideration. To this end he was about to dispatch a commission of liaison officers to London. On this occasion Evans emphasized especially the need of a well-organized intelligence service with agents permeating the enemy's country.

"At sea it is universally admitted that by virtue of our great preponderance of available power, we must take command," said Evans. "But in the matter of intelligence service there is none on earth that can touch the British, and I believe we had better play that game under their lead.

Their organization is marvelous, and the best we can do is to fit our machinery to theirs.

"You know, I think there's something in the temperament of a certain type of Englishman that fits him extraordinarily well for the hazardous game of secret service in enemy country. It's his faculty of keeping his thoughts and feelings to himself, his impenetrable exterior, together with his coolness in danger."

"Haven't we plenty of men with those same faculties?" Mortimer asked.

"It's rare to find them so well developed in an American. Then, too, there's a thoroughness in the education of the British scholar that helps him grasp new and difficult problems. What I'm driving at is this:—there ought to be some one in Constantinople who is not only a damn clever spy, but who also understands what you can do with radio."

"You're trying to combine too much in one man," said Mortimer. "You don't want to have your secret agent for intelligence bother his head with technical stuff like radio; he should rely on others for that."

"Of course he should, as far as handling the apparatus is concerned. But he must grasp the basic principles, so that he'll understand the kind of thing modern apparatus will do for him.

"Both in regard to secret service and to coördination in general, we must get together with the British communication experts and come to an understanding about codes and apparatus. Science has given us such a wealth of new methods in radio engineering that much depends on a clear understanding of what your apparatus will do. The British have developed it along their lines, and we along ours. There should be consultation to determine the best way of standardizing procedure in the fleet, and still more impor-

tant at the moment is to consult with them as to how recent developments in both countries may be made to help the business of communicating with our spies."

"I wonder if it wouldn't be a good plan for you to go with the commission we are sending to England, and confer with their radio men on the matter of apparatus and communication methods in general," said Mortimer.

"I believe it would," answered Evans. "I should like to discuss those points with them, and I should like particularly to see some man in their intelligence service who understands radio methods, or at least their possibilities, and who could get into Constantinople; together we could work out codes and ciphers and other matters of procedure that would facilitate the transmission of intelligence to us from that interesting spot."

"All right; I'll send you along with the bunch," said Mortimer. "I think the party will be ready to go in four or five days."

"I've been thinking," said Evans, still following his previous train of thought, "that an old friend of mine in England would be the ideal person for that job; I mean, to undertake to keep us posted from enemy headquarters. He's an archæologist by profession, and the most versatile man I know. He has spent a lot of time in Greece and Asia Minor, knows Constantinople and the Balkans like a book; he's a wonderful linguist, and the best actor you ever saw. His name is Heringham. I used to play chess with him when I was studying in the Cavendish in Cambridge, and I never knew a man who could fool you more adroitly as to his real plan of campaign. He used to take every kind of part in student theatricals, from a Buddhist to a buffoon, and to realize that the same man did them all would tax your powers of belief to the limit. I don't think

he knows much radio, but he has a good scientific foundation, and he's so confoundedly clever that he'd learn what he needed for that job in no time. I'd give a lot to have him in Constantinople and to have had a chance to plan things a bit with him first."

"What's he doing now?" asked Mortimer.

"Nothing important," was the answer. "I got a letter from him saying he offered his services to the army, and was rejected because of his age and a slight defect in his eyes; he's forty-one or forty-two. He's still living at his rooms in Trinity, trying to make himself useful at odd jobs."

"Do you suppose there's any way of getting your wish realized?"

"I don't know. I'd like to get over there and see what can be done."

"I'll give you letters to any one you want," said Mortimer.

"I think I'd better keep away from the mighty men at the top, and have my business talks with their technical radio men. Send over Barton who is right-hand man to the Chief of Naval Intelligence, and the real brains of the Bureau, and tell him how much you want me to dip into his line of business; he's no red-tape artist. Between us we may find a way to the sort of collaboration we want."

A few days later a scout cruiser capable of forty knots slipped out of the Navy Yard at Portsmouth, New Hampshire, and headed south, passing between the Isles of Shoals and Cape Ann; but when well out of sight of land she changed her course to east, and sped rapidly out to sea, making several knots better than her economical cruising speed. On board of her was a group of liaison officers of high rank, Commander Barton, of the Bureau of Naval

Intelligence, and a number of experts on naval specialties — ordnance, aircraft, and the like, including Evans and a certain Lieutenant Brown representing the Director of Naval Communications.

The ocean passage lasted four days. Evans spent much of his time in the radio room at the congenial pastime of discussing problems with the chief radio electrician and his operators, and helping them tinker with apparatus. A radio chief likes to discuss his set with any one who has a genuine interest, and it wasn't long before the chief and all the operators were picking up innumerable hints on the newest engineering developments. The radio officer of the ship was an ensign named Lindsay, a youngster just out of Annapolis with a sunny disposition and a wholesome boyishness about him that won Evans's heart. He was also free from the conceit of rank which constrains some ensigns to treat a warrant officer with a forced superiority. He had little knowledge of radio, and, as is usually the case, relied in technical matters on the chief radio electrician. He soon found in Evans one from whom he could learn what he needed to know of radio methods, without the sense of losing prestige which some officers feel to be associated with acquiring information from one of subordinate rank. Before the voyage was over, Lindsay had acquired a new outlook on the significance of communications and the possibilities which lay in the various methods a ship may use for picking up and transmitting information concerning the enemy, such as hydrophones, radio direction-finders, amplifiers, selective devices to avoid interference, and secret methods of signaling. With this enlarged vision there was born in him a new enthusiasm for his task.

On a cold, gray autumn day the cruiser passed the Lizard, rounded Rame Head and Penlee Point, and dropped

anchor in Plymouth Sound. In another hour the party was speeding through the mellow green hills of Devonshire on its way to London. The next day found Evans at the great National Physical Laboratory at Teddington where some of the best brains in the world were engaged in coördinated research to solve the many problems of physical science and technology which the peril of the Empire had rendered vital.

More than one physicist whom he had known years before at the Cavendish Laboratory did he now find serving here as a department head. One of these, knowing his work in the field of pure science, expressed surprise at seeing him in a rank below that of sublieutenant.

"You shouldn't be wasting yourself as a gunner," he said; "you ought to be directing research."

"Well," answered Evans, "I manage to get a shot at research now and then, and the kind of duty that comes my way on this job suits me pretty well, on the whole."

Before he had been in London a day, Evans had arranged to see his friend Heringham in Cambridge. He took an afternoon train thither, and found dusk gathering in the narrow streets of the ancient town. At the sight of familiar landmarks, shops, and churches, memories came flooding over him of the happy winter spent there in his youth, learning from the world's greatest masters of pure science. He recalled the profound debt he owed to the Cavendish for its part in the moulding of his career, and with the thought a deep gratitude stirred within him. Crossing the market-place, he came to the old College buildings, the beauty and dignity of their architecture never more impressive than now in the twilight. At last he came to the venerable main gate of Trinity and entered the Great Court, hallowed by the memory of Newton,

Tennyson, and a host of other men of genius, through centuries the greatest fountain-head of high scholarship and learning in Anglo-Saxon civilization. He stopped and looked about him, and the realization of all that this place stood for came over him as it never had before. Here in these walls of weather-stained and crumbling-stone was the cradle of that intellectual and spiritual growth which constituted the real world in which he lived and for which he would gladly die. There arose before his mind a picture of the calculating and mercenary group in Constantinople, and the cynical and iconoclastic spirit in which they would wreck the shrines of Western civilization and learning should they win the fight. He set his teeth and crossed the court to the stairway leading to Heringham's room.

He knocked at the door and found his friend sitting by a small coal fire, smoking his pipe and reading the non-committal news in the daily paper. Seated together by the fire, these two congenial souls were soon chatting comfortably on the basis of a natural and inalienable understanding which existed between them. Evans found, as he expected, that Heringham possessed an extraordinary knowledge of the leading characters in the Constantinople conspiracy and how matters stood among them.

"You ought to be using this knowledge in some way," said Evans.

"How can I?" asked Heringham. "The army rejected me, and here I am."

"Could you smuggle yourself into Constantinople without disturbing the equanimity of these devils you've been telling me about?" said Evans.

Heringham sucked hard at his pipe and stared at the fire.

"I don't know that game," he said at last. "I imagine it takes rather a lot of experience."

"I can't think of any one who would learn it quicker than you, and you've got a big head start in your knowledge of the country and the people you would have to deal with," said Evans.

Again Heringham thought awhile in silence. "I dare say I could get there if I had to," he said musingly, "but then, I don't see much prospect of their asking me to."

"Oh, well," said Evans, "you never know what may turn up next."

"What's up?" said Heringham. "Have you got strings on the dear old things in the War Office that you're going to pull?"

"Not that I know of," said Evans. "But I'll tell you a little of our situation. Mortimer, our Secretary of the Navy, happens to be an old pal of mine; classmates we were, in school and college. He's a trump, dead in earnest and a splendid organizer. But his life-work has been law and politics, and when this job fell on his shoulders he knew no more of naval affairs than I know of Sanskrit. In spite of this handicap he's making good, but he needs a good deal of technical help, and I'm trying to contribute what I can in the field of communications."

He went on to explain the nature of his present mission to England, both as to consultation in the matter of radio apparatus in general, and in particular as to effecting co-operation with the British Intelligence Service for the transmission of information by radio to the Allied Navies.

"Barton, of our Intelligence Bureau, is over here," he said, "and he will have access to the men who control things in your Intelligence Service. He is the only one in our mission who knows that I'm not concerned simply with radio apparatus. I can talk to him, and he'll listen."

"Well, old chap," said Heringham, "I'm at your disposal

or his, to stick my head in the lion's mouth if it will do any good. Lord knows I've been hating myself to death here, doing an old woman's odd jobs when I should be fighting. By Jove, there's eight o'clock striking; come over to Hall and we'll have some dinner."

The slow tolling of the College bell came ringing across the court. Heringham slipped on his academic gown and led the way out into the Great Court where they joined the converging streams of dons crossing to the famous Hall where hang the portraits of more great men, past members of Trinity College, than can be found in any similar place the world over. At dinner Evans sat between Heringham and an elderly professor of Greek, with a distinguished face and a white beard. With this scholar he soon became engaged in a conversation of absorbing interest, which furnished him useful scraps of information bearing on the present situation in the Mediterranean, based on the old man's intimate knowledge of the Greece of an earlier day.

After dinner, the dons migrated in procession to the Combination Room where Evans sat next the Master of Trinity, an eminent mathematician, who plied him eagerly with questions about the American Navy, as they sipped their port and coffee. He, at least, was keenly aware that on this group of ships, and the controlling mind behind it, rested the future of all.

Returning at length to Heringham's room, they poked the smouldering coals into flame and returned to their talk of the European situation, and of Heringham's availability for playing the part which had been suggested for him. Evans questioned him closely as to his knowledge of physics. Of radio he knew nothing in detail, but his knowledge of fundamental principles was good. Their talk engrossed them the best part of the evening.

Heringham then went with him to the gate to say the 'open sesame' whereby the night porter was induced to let him out into Trinity Street, dark, narrow, and deserted save for a lone man who passed on the opposite sidewalk as Evans came out and started for his hotel.

Returning next day to London, Evans sought Commander Barton and drew for him a picture of Heringham's qualifications which filled that officer with enthusiasm for the plan of getting him impressed into service. He had already been in conference with several of the head men in the British Intelligence Service and was satisfied that there was a distinct need for just such a person in the heart of the enemy country. A number of able agents were already there, but they had gone in before the American Navy had entered the field and become the most important force for them to collaborate with; moreover, they had not at their disposal the radio experts who would be needed to find means of transmitting intelligence to sea. Barton, therefore, took very kindly to the idea of sending in a man like Heringham who could previously prepare a concerted plan of action and a system of codes with representatives of the American Navy, and who could then proceed, together with an experienced operator, to penetrate to enemy headquarters there to direct the leakage of information through whatever channel his ingenuity could discover or devise.

Three days later, Heringham received an urgent request from a certain high official to come at once to London for an interview. Proceeding to the street and number mentioned, he was taken in a taxicab to another part of the city where he was ushered through innumerable doors and corridors to a small room where an officer with penetrating eyes questioned him minutely about his life and activities, and especially his experience in the Near East. After a

searching examination, this officer finally revealed his own status in the British Intelligence Service and asked Heringham if he would be willing to undertake secret service in enemy country, and the upshot of it was that then and there it was arranged that he should be sent on the hazardous and responsible mission.

Busy days followed in which Heringham, besides receiving instruction as to his duties and methods of procedure from those above him, was also in frequent conference with Evans and Barton, planning their general course of action and devising codes. They anticipated that their main reliance would be placed on smuggling operators into the crews of enemy transmitting stations and having them superimpose messages in secret code on the regular traffic of the stations. Therefore, two experienced radio operators were also selected and educated in the lore of spies that they might go to Constantinople and there act as technical advisers to Heringham.

In these conferences Evans came to realize how sharply his own point of view, as a physicist, differed from that of Barton, the trained Intelligence officer. Problems which he saw from a purely intellectual point of view took on a wholly new aspect when Barton's ready and practical wits had been focused on them. Evans felt his own shortcomings in this strange world of secret service, a world in which deliberate scientific reasoning was replaced by intuition, dissembling, and juggling with the caprice of human nature. He felt as awkward as a country bumpkin in the midst of a group of experts at flashing repartee.

In addition to these conferences, Evans devoted all the spare time he could to instructing Heringham in the essentials of radio science and engineering, that he should understand more fully what kind of opportunities might present

themselves for juggling with the radio business of the enemy.

Advices were sent through the mysterious channels best known to those who practice the art of secret service, to the agents already in Constantinople, apprising them of the plan to send Heringham to join them; in return, valuable suggestions were received from them concerning conditions in enemy country.

The adventurous nature of Heringham's mission took such a hold on Evans's imagination that he became absorbed in the planning of it with the eagerness of a boy building some new castle in the air. It was only with effort that he turned his attention to what was nominally his own mission, the consultation with British radio experts on technical matters. He managed, nevertheless, to confer with the best men in this field in England, and to compare notes with them on recent progress. He learned from them what improvements in British apparatus could, without lost motion, be advantageously incorporated into American gear, and arrived at an understanding with them on the standardization of apparatus wherever this was desirable.

One night, after a late conference with Heringham and Barton, Evans was walking back to his hotel in the vicinity of Trafalgar Square, when he met Lindsay. In the darkened street they might not have recognized each other had they not met close to one of the dim, blue street lights. It was the first time they had met since their arrival in England, Lindsay only just having come to London for a few days of leave.

"Hullo," he said to Evans. "Are you having a time doing up old London?"

"I'm having a time, all right; but I don't know that it's the kind of time you mean."

"Well, whatever kind of time it is, don't overdo it."

As he spoke, Lindsay's eye followed a figure on the other side of the street, walking in the same direction that Evans had been going when they met. Evans, following his glance, saw a man with a businesslike step walking by. The man turned down the first side street, and as he turned under the street light at the corner, Evans caught a glimpse of a sallow face. When the sound of his footsteps had died away, Lindsay said in a manner that seemed more than half-joking:

"It looks to me as if you were being shadowed; that man stopped when you stopped, then crossed the street. What are you up to, anyway?"

"I don't believe any one wants to bother about shadowing me," said Evans.

"You'd better let me go along and look after you, or some fellow will get you with a sandbag while you're up in the clouds thinking about wave lengths or frequencies or something."

"Come along," said Evans. "I'll be glad enough to have you."

"I guess I'd better mind my own business," said Lindsay; "but watch your step, old man."

They parted, and Evans told himself that, of course, Lindsay was joking. Yet, as he walked on through the lonely streets, he wished his young friend was still with him. Just before he reached his hotel, he heard a strangely familiar tread on the pavement a long way behind him. Looking round as he turned to enter the hotel, he saw dimly in the darkness a block away the form of a man; and though obviously too far off to warrant any valid judgment, Evans couldn't escape the feeling that it was the same man that he and Lindsay had just noticed. At the

same moment there flashed into his mind an uncomfortable feeling that it was the same man he had seen on Trinity Street in Cambridge when he was saying good-night to Heringham after their first talk. Evans laughed at himself for letting the darkness and the strange blue street lights make him wax superstitious. Of course it was all a trick of imagination; no one would waste time shadowing him — a mere warrant officer. Yet it was with a keen sense of relief that he found himself safe inside his room at the hotel.

Very soon after the commission of liaison officers arrived in London, they were assured by the British authorities in no uncertain terms that the navy was the keystone of everything. A message was cabled to Washington which swept away all vestiges of doubt in the President's mind that the navy must come first, and which materially facilitated his adoption of the necessary action giving the navy first claim on the draft, which had now passed Congress.

After three weeks of strenuous activity on the part of the entire commission preparing plans for the consolidation of the naval forces, they embarked in their scout cruiser at the great Devonport dockyard where the noise of hammer and riveter, the great heaps of steel wreckage from repaired ships, and the general atmosphere of miscellaneous naval activities betokened its great significance as a naval base. On the high tide the long, slender cruiser glided quietly out through the narrow channel between Stonehouse and Cremyl, and in the gathering darkness left Plymouth Sound for the open sea. Four days later the party landed in New York, and proceeded without delay to Washington.

CHAPTER IV

PROGRESS IN JEOPARDY

IMMEDIATELY after the return of the commission to Washington, a meeting was held in the Bureau of Engineering, at which those results of the mission to England which had to do with engineering problems were reported.

Admiral Bishop, Chief of the Bureau, presided. He was an elderly officer of robust build, with a hearty red face and white side-whiskers. At his right hand sat Commander Rich, head of the Radio Division of the Bureau, a thin-faced man with an aquiline nose and dark mobile eyes; his face bespoke an alert mind and quick perception. He had enrolled in the navy as a radio electrician many years before. By his ability he had risen through the various grades to warrant officer, and had been one of those selected from this status for the course at the Naval Academy. In this way he had risen to his present rank of commander. Heads of other divisions of the Bureau also sat at the large table near the center of the room. The three or four officers who had been sent abroad on engineering problems were present with their reports. Lieutenant Brown, although attached to the office of the Director of Naval Communications, and therefore belonging to the Bureau of Operations, was present, for among those who had been abroad he was the senior officer concerned with communications. Various other officers, whose duties dealt with the diverse branches of engineering, sat in chairs around the walls of the room. Among these was Lieutenant-Commander Elkins whom Evans had sized up as the most intelligent and open-

mind of all the officers in the Radio Division of the Bureau. His technical training in radio engineering was less than that of some of the others, but perhaps by just so much was he free from prejudice in favor of home-made apparatus.

Before the meeting Evans had sought Elkins and explained the results of his investigation of radio methods in England. The British experts had presented convincing reasons for the universal adoption of some of their best engineering developments. One improvement in particular, a new type of vacuum-tube transmitter which they had recently perfected, far surpassed anything that had yet been seen, and by its efficiency in eliminating interference it opened such extraordinary possibilities in the scope of fleet communications that without it the navy would be lagging sadly behind the more progressive Allies. Adoption of this transmitter would mean scrapping a great deal of gear now in use, yet the facts learned in England showed plainly that the navy could not afford to do otherwise. Elkins saw this, and so did Brown. It was Brown's rôle to report on the handling of communications. This problem was indissolubly linked with that of producing the apparatus, but on all technical phases of the subject he left it to Evans, with his superior scientific knowledge, to report their findings to the meeting.

As clearly as he was able, Evans described the most important contributions which the British had made. He warmed to his theme as he came to their most brilliant feats of invention, especially the new vacuum-tube transmitter. But at this juncture his enthusiasm met a check. Admiral Bishop shook his head in disapproval, and remarked that it would be most unwise to abandon the apparatus which had been so successfully developed by American talent. One or

two of the other officers nodded acquiescence. Evans was accustomed to the discussion of problems in physics at meetings of scientists where the quest of truth was as genuine in the others as in himself. He now started to argue the case much as he would have done at such a meeting. Too late he saw his blunder; the opinions of a warrant officer were not to be set up against those of the Bureau Chief. His insistence had only served to incense the Admiral. When he saw the effect of his remarks, he shut up like a clam, and, smarting inwardly with self-reproach enhanced by the rancor of annoyance at the official complacency of the Admiral, listened through the rest of the conference.

Elkins endeavored to argue the case.

"There's a chance here to increase the efficiency of our communications one hundred per cent," he said, "I believe, sir, we shall be making a grave mistake if we don't at least give this transmitter careful consideration."

But Admiral Bishop only shook his head the harder; he had set the official seal of his disapproval upon the adoption of the British transmitter, and it was clearly the sense of the conference that American-made apparatus and American methods were undoubtedly the best. It is difficult to discard one's own organization and adopt in its stead the creation of a foreign nation; and to recognize when a situation demands that course, requires more imagination and honesty of mind than most men have.

As the meeting was breaking up, Commander Rich approached Elkins and Evans and said, graciously:

"I admired your report on that British apparatus; clearly it merits the most careful consideration. But, of course, you must recognize the difficulties in the way of radical changes involving destruction of gear already in

use, and you will realize the natural reluctance of an older man like the Admiral to take such a course unless it is necessary. However, you may be sure I will see to it that all arguments in favor of the British apparatus are given a fair and impartial hearing."

After Commander Rich and the others had left, Evans continued to discuss the matter with Elkins and Brown. They tried to view it from Admiral Bishop's standpoint. Would it be better, after all, to ignore the valuable advances made by the British, and to use only the apparatus of home design, and demand of the British that they adopt American procedure for the sake of uniformity? Viewing it from every possible angle, they all agreed that this course would be the height of folly, for it would materially impair the efficiency of the fleet, and would also make a very bad impression on the British experts by using dominance in numbers to force on them the adoption of obviously inferior methods. The British had been more than willing to adopt such of the American procedure as was superior to their own. How would they feel if America failed to reciprocate where common sense clearly demanded it? This would be an ill omen for friendly coöperation.

"It's too important to let slide," Evans said to himself, "but it wouldn't be wise to bother Sam with it, if I can help it. He's got enough on his hands, and any insistence on his part that the Bureau should go against the wish of the Chief might do a lot of harm. It's got to be done some other way."

Impelled by this feeling, he voiced his sentiments more earnestly than ever to Elkins. The implied criticism of superiors would have deterred both men from candor had it been the average lieutenant-commander talking with the average warrant officer. But when in time of stress men actuated by the right spirit join in a disinterested effort to

serve a cause, matters of rank and seniority automatically drop out of the equation. Elkins assured him he would use what influence he had, but was by no means confident of his ability to do anything with the Admiral.

Evans remarked: "It would help a good deal if a demand for it made itself felt from the D.N.C. office. Engineering supplies the apparatus and Operations uses it. There are times when Engineering can take the lead by developing gear which creates new possibilities for Operations; there are times when Operations can take the lead by saying to Engineering, 'We want apparatus that will do so-and-so; can you make it?' Now, if Operations, as embodied in the D.N.C. office, could make just the right request, it might shake things up over here. Mr. Brown, have you got some live wires in your office?"

"Yes, a few," replied Brown; "but I don't know just how to rouse them to the kind of action that you want."

"That may be rather difficult," said Evans; "but there's no knowing what a little modern telepathy on scientific lines may accomplish."

"I took you for a simple-minded scientist," said Elkins, "but from the way you talk I begin to think you're a regular politician."

Evans laughed. In the next few days he found business to discuss with Lieutenant Brown at the D.N.C. office. While he was there, discussions arose over modern problems of communications in which he was consulted as technical expert.

Ten days later, after Elkins had been preparing the ground among some of the officers in the Bureau of Engineering, they received an intimation from the Director of Naval Communications that the British procedure was deemed most suitable for adoption throughout the Allied

fleet, and that it would be desirable to produce, if possible, apparatus suited to this procedure. These officers asked Elkins if any information was available bearing on the feasibility of providing something which would answer these requirements. He said he would find out, and soon returned with specifications following close to those of the British transmitter, and estimates furnished by the best available manufacturers. Armed with this information he took the case to Commander Rich. This officer expressed a warm appreciation of the valuable work performed in securing the information and estimates, and said he would take the matter up with the Admiral. After a conference with Admiral Bishop, Rich sent for Elkins and told him the Admiral had been firm in his refusal to abandon the gear then in use and to adopt in its stead the proposed apparatus.

"Admiral Bishop is conservative," said Rich, "but we must remember that he is a man of great experience, and wiser than we."

Evans was dismayed when Elkins told him the news.

"I don't like it a bit," he said. "It seems as if there were something more than mere conservatism in this."

"What do you mean?"

"I don't know," was the reply.

"Well," said Elkins, "you know it is devilish hard for an older man to throw overboard the things he's used to and take on something entirely new."

"I know," said Evans, "but this case is so perfectly clear — well, I don't know."

That evening Evans spent an hour with Mortimer in his private study. Their talk was concerned chiefly with the broader problems of naval policy. Evans did not tell him of the trouble over the transmitter, but merely remarked that

the mission to England had been fruitful of most interesting developments, especially in connection with the radio problems that concerned both the Director of Naval Communications and the Bureau of Engineering.

"When do you expect to visit the Bureau of Engineering again? You'd be interested to hear something of this from the men at the top," said Evans as he was rising to go.

"I'll be round Friday morning," replied Mortimer.

Evans knew Mortimer's habits well enough to be quite certain that this meant about eleven o'clock.

Next morning he went to the Bureau of Operations and sought Lieutenant Brown. This officer and his chief, Admiral Fraley, the Director of Naval Communications, were greatly disturbed by the refusal of the Bureau of Engineering to furnish the apparatus required for adapting their procedure to the improved British plan; they hardly knew what to do about it. Evans now told Brown to tell his chief that he had heard from some one in the Bureau of Engineering that Friday, a few minutes before eleven, would be a favorable time for him to see Admiral Bishop about the question of apparatus. This intimation was duly passed on to Admiral Fraley.

Acting on this intimation, Fraley called on Admiral Bishop just before eleven. He had scarcely opened the subject when Secretary Mortimer was announced. In spite of a good measure of self-possession, Admiral Fraley's face revealed to Mortimer's keen perception a trace of the annoyance which he naturally felt at losing his chance to present his case to Admiral Bishop. He started to withdraw, but Mortimer stopped him and said, "Don't let me interrupt your conference."

"I can come back some other time," said Fraley.

"I'm here to promote, not obstruct, the work of the

department," said Mortimer. "I'm interested in everything that goes on, and if my presence doesn't embarrass your freedom of speech, I'd really rather have you go on with your business; I'm in no hurry."

Admiral Fraley hesitated a moment, then, as it flashed on him that Mortimer's presence and interest might offer a rare opportunity of support from superior brains and authority, he stated his case. He explained how Lieutenant Brown's report on British methods made it seem imperative that certain of their procedures depending on their new transmitter be adopted, and he further said he understood that those who had looked into the technical side of the matter were convinced that it could be done. He wondered what was the difficulty in the way of supplying the necessary apparatus, and whether there might not be some way of surmounting it, in view of the great tactical importance of conformity with the British in this respect.

Admiral Bishop was nothing if not pompous. He was senior in rank to Fraley. His round, red face became slightly redder at what appeared to be the airing of a difference of opinion in the presence of the Secretary. But with Mortimer's keen eye upon him, he was aware that this was no matter to be put off with a display of authority and rank.

His manner was therefore affable enough as he replied: "In all matters pertaining to radio apparatus I rely on the judgment of Commander Rich, who is in charge of that division, and whose wisdom in such matters is quite unsurpassed. He gave me to understand that he had inquired into the matter thoroughly and could assure me that the alleged advantage of the British procedure amounted to practically nothing, and was certainly not worth making the expensive change involved in removing vast quantities

of material already installed in the ships and replacing it with something comparatively new and untried, with which our operators are unfamiliar."

Mortimer looked at Admiral Fraley, who appeared perplexed and rather taken aback.

"There seems to be a surprising conflict in expert opinion," remarked Mortimer, "and this on a matter of some importance. Can't we call in the exponents of the conflicting views and come to an understanding here and now?"

"I can send for Commander Rich," said Admiral Bishop.

"Who are your authorities on the side of the British procedure?" Mortimer asked of Fraley.

"Lieutenant Brown of my office reported on the traffic end of the question," answered Fraley. "He got his information on the apparatus chiefly from Lieutenant-Commander Elkins of this Bureau and also from a radio gunner who obtained most of the data, as I understand it."

"Let's get them all in here and thrash out the problem," said Mortimer.

Thereupon Commander Rich, Elkins, Brown, and Evans were all summoned. Mortimer was spokesman.

"I chanced to be present," he said, "as Admiral Fraley was asking Admiral Bishop if there was not some way to overcome the obstacles in the way of supplying the apparatus needed for the adoption of this British procedure which, from the standpoint of operations, he deems so important. From what I heard I gathered that there had been some misunderstanding, and I thought we might clear it right up. Commander Rich, I understand from Admiral Bishop that you have looked into this and concluded that it was not of sufficient importance to warrant the expense of making the necessary changes. Am I right in my understanding?"

Evans and Elkins both looked at Commander Rich in surprise. He appeared perfectly at ease as he replied in a manner which bespoke deference and conciliation: "Mr. Secretary, if I in any way underestimated the advantages of the British procedure, I am sure it was quite unintentional. What I endeavored to do was to sum up the pros and cons as impartially as I could, and to defer to the superior judgment of the Admiral, rather than to seek in any way to influence his decision."

"It was my impression," said Admiral Bishop, "that you favored adherence to our standard procedure, a course to which I should naturally incline, to be sure, unless very good reasons for changing were forthcoming. Perhaps, however, I misunderstood your attitude."

The Admiral's memory was not clear enough to recall that Rich had reinforced his natural conservatism by intimating, before the meeting at which the matter was first brought up, that changes were about to be proposed which it would be unwise even to consider.

Mortimer then asked for a summary of the case for the proposed changes. Brown, at the request of Admiral Fraley, explained the salient points of the communication problem. When he came to the question of the needed apparatus, he referred Mortimer to Elkins, who in turn referred him to Evans. In a few words Evans stated the advantages of the apparatus.

"What about the expense and difficulty of having it installed?" said Mortimer. "This seems to have been a seriously deterring consideration."

Evans answered with figures and estimates which decisively disposed of this difficulty, leaving the case so clear for the proposed changes that Admiral Bishop could not do otherwise than authorize them.

Soon after this incident, late one afternoon when the day's work in the Bureau of Engineering was done, and almost every one had gone home, Evans lingered, as he often did, over a knotty engineering problem. As he was leaving to go, he saw in the corridor a man with a sallow face going into Commander Rich's room. He knew Commander Rich often stayed in his room long after the others had gone, and many people had business with him; so there was nothing remarkable about this. But to-night the sight of this man gave him a vague, uncomfortable feeling, scarcely more than subconscious, that he had seen him somewhere before. Also in a seemingly haphazard way the thought and feeling of England stirred in his subconscious mind. But the guileless physicist was so absorbed in his engineering problem that these matters never quite reached the arena of his conscious thoughts. He had so much to think about that he had neither time nor inclination to heed such capricious freaks of the subconscious, and the impressions soon passed into the storehouse of forgotten experience.

During the winter months following the return of the commission to Washington, the navy was preparing in a hundred different ways for the task which lay before it. The draft law having been passed, large numbers of recruits, the pick of the draft, were assembled at training stations and rapidly absorbed into the fleet and the various naval bases on shore. Fortunate they were that the organization into which they were thus merged was led by such a body of men as the officers of the United States Navy. Through the long years of indifference on the part of the majority of their countrymen, these faithful guardians of the Nation's frontier, trained at the Naval Academy to a high degree of professional skill, without which the complex organization of the fighting ships cannot function, had served with zeal,

and against great odds had kept the fleet ready — kept the colossal machine intact, so that the hordes of untrained men could be assimilated with the least possible loss of time and effort.

Ship and aircraft construction were accelerated by all known means, and the work of designing and experimenting in every department went on with ever-increasing efficiency and concentration. In gunnery no department was neglected; on ships and in training stations drills with loading machine and dotter were carried on with zeal, and everywhere the officers saw to it that the high standard of efficiency in this field was maintained.

The convoy system had been adopted with the declaration of war, and, with the aid of light cruisers and destroyers, great quantities of essential supplies were being poured into Northern Europe, enabling the Allies to keep up the fight, but by no means to break the deadlock. Nor were the convoys always able to pass unscathed through the submarine-infested seas; the toll of ships and cargoes proved a serious drain on the Allied strength.

During these months, Evans, dressed in civilian clothes, dined with Mortimer at his house almost weekly, and after dinner they would sit alone together in Mortimer's study, discussing the great problem of the war, often late into the night. Mortimer would tell of the deliberations and decisions of the General Staff. Evans would listen attentively and question him on significant points whose importance Mortimer himself had sometimes missed.

Plans for combating the submarine menace were now developing apace. In spite of the convoy system, serious losses of tonnage kept occurring, and methods of searching systematically for the undersea pirates were eagerly sought. The Bureau of Engineering was devoting intensive effort to

testing, perfecting, and installing in new vessels the best available hydrophones (underwater listening gear) and radio compasses (direction-finders), the latter both for finding the enemy by his wireless signals and for making contact with friendly craft when desired, as well as for purposes of navigation in thick weather. Evans devoted most of his time to these tasks, taking a hand in the work of improving methods, and exercising general supervision over the installation, testing, and calibration of all this sort of gear. As in 1918, a special two weeks' course was started for instructing radio operators in the use of the radio compass, a course given in a laboratory by young radio experts. The operators, as fast as they finished this course, were sent aboard destroyers and other ships where the apparatus was installed, with the understanding that they were fully trained in the use of it. Evans endeavored to enlist the help of these operators in the work of testing and calibrating the apparatus; but he found that more than half of them, although supposedly radio-compass specialists, were utterly useless for the task. Their teachers, being inexperienced in the psychology of the student, had failed to impart the essentials, except to those of more than average intelligence; and, what made matters worse, the laboratory instruction had not approximated the actual conditions aboard ship. Even if the principles had been grasped, the operator found them difficult to apply under conditions so remotely resembling those of the laboratory. Evidently, to send these men out in charge of the radio compass aboard ship would mean the failure of the apparatus in about fifty per cent of the cases in which its use would be required.

It was clear that the course should not only be improved, but should be supplemented by practical instruction aboard ship. Evans conferred with Lieutenant-Commander

Elkins, and suggested to him that a motor-boat be equipped with a radio compass and that the operators be taken out on her and given practice in reporting the bearing of a transmitting station as the motor-boat steered an irregular, zig-zag course. Aside from the advantage of instruction and practice under actual working conditions, the fitness of a man for radio-compass duty could thus be readily determined. At first they should practice on a transmitting station sending signals continuously, and thus facilitating the readings by giving them plenty of time for their observations; next, they should assail the more difficult task of taking bearings when the transmitting station sent only brief messages. Naval experts have pointed out that the enemy, knowing that his signals will probably be used to locate him by means of the radio compass, will make his messages as brief as possible, in order to render difficult the work of direction-finding; hence the importance of training the operators by calling on them to take bearings with messages of ever-increasing brevity.

Elkins endeavored to arrange through the "usual channels" to have a motor-boat assigned to the Bureau of Engineering for this important training duty. But in this he met obstacles. Those who had control of the available motor-boats were not interested, and did not see the need of it; furthermore, Commander Rich told him Admiral Bishop felt that any training of operators beyond what was already provided would be quite unnecessary. Elkins told Evans the discouraging result of his effort.

"What damn nonsense!" said Evans, frowning. "There needs to be a demand for efficient operators that will make itself felt enough to shake loose some of the stiff joints of this organization." Then, after a pause, "Maybe the demand will come."

That evening Mortimer heard the whole story.

"I guess it will be a simple matter for me to arrange to have a motor-boat set aside for this work," he said to Evans.

"Wouldn't it be better not to have them get the idea that I have a 'drag'?" said Evans. "Then, too, sequelæ embarrassing to Elkins might result if such an order came through just after his request had been turned down. There's a better way than that. Isn't it about time for you to decide that you want to determine whether the radio-compass machinery — material and personnel — is up to the important task required of it? You could order a practical test — a board appointed to make it — and for samples of the goods, eight or ten operators just through the compass course, selected at random, aboard a destroyer with the gear just installed. Let 'em show what they can do with signals sent from various bearings. Make them come across quick with the test so that there won't be time for any one to cheat it by giving the operators special training. I am confident this test will show that something is lacking. Then let us have some men along who know a radio compass when they see it, to show what the gear can do if you understand it, lest perchance the apparatus be condemned instead of the poor boobs that are miscalled experts."

It seemed altogether natural when a few days later the Secretary of the Navy appointed a board to conduct a test of the radio compass and the men assigned to operate it, under the nearest possible approach to service conditions. Ten operators just from their special course were to report on board a destroyer whose radio compass had recently been installed. Three patrol boats were to maneuver about her and each one in turn was to send signals for one

minute. Thus the radio signals would come from unexpected angles. The operator was to be shut into the radio-compass shack, so that he couldn't see the patrol boats, and was to report the bearing by voice-tube to the bridge as soon as he had determined it. Then the Bureau of Engineering was to select for comparison four operators known to be really familiar with the radio compass, to take bearings on the same patrol boats after the new operators had completed their test, in order that a fair basis might be established for judging the operators as prepared by the special course.

When this order became known, Elkins was delighted. "Now is our chance," he said to Evans, "to have this thing properly tested, and we'll know whether those boys need some practical drilling or not."

Together they picked the four best men among the radio chiefs who had been helping with the radio compasses, and made sure that when it came to their part of the test they would not be found wanting.

On the appointed day the destroyer steamed out into Chesapeake Bay accompanied by the three patrol boats. Secretary Mortimer was on board, for he deemed the experiment important enough to warrant his personal observation. Admiral Bishop, Commander Rich, and Elkins had come to represent the Bureau of Engineering, and Elkins had obtained permission to bring Evans to be sure that the gear was in working order.

Commander Rich was almost constantly at Mortimer's side, talking with him pleasantly or earnestly as seemed most fitting at the moment. He spoke of the value of a broad sense of proportion in naval matters.

"Some people," he said, "can't see anything outside their own little problems. A man in charge of a thing like

this radio compass, for example, is apt to think it's the most important thing in the whole navy, and everything else should give way before it. I believe a man should see the problem as a whole. Now take my case: I'm in charge of radio, but it would be silly of me to fancy that radio was the most important thing in the whole organization. I recognize that Admiral Bishop has a much wider vision, that radio is only one small part of a colossal machine, and I am ready to defer to the needs of gunnery and the like when occasion demands."

In preparation for the test, Evans had to come up on the bridge to confer with Elkins. Encountering Commander Rich, he saw in his face a look of scorn as this keen-looking officer eyed him in his dungarees, and in the look he fancied he saw, too, something more sinister than scorn. It haunted him as he returned to the radio compass, but with an effort he dismissed the thought, convincing himself that it was probably the result of pique in his own rather sensitive nature.

Commander Rich, watching Evans swinging himself nimbly up the ladder to the radio-compass shack, remarked jovially to Mortimer, "Looks to me like that gunner had a little of that monkey-gland extract you read about, the way he goes climbing round the ship."

And when during the subsequent stages of the test Evans appeared, Commander Rich was ever ready, if the chance offered, to drop a sarcastic remark about the "monkey-man."

Admiral Bishop had some difficulty engineering his portly form up the steep ladder leading to the destroyer's bridge. It would be hard to find anywhere, on land or sea, a scene more vividly expressive of human efficiency than is presented by the bridge of a warship executing a maneuver

even of the simplest sort. Officers, signalmen, and helmsman, alert and intent on the perfect team-work needed to fit the operation of the ship into the working of the larger machine, the fleet, execute their orders in a way that testifies to the high character of their training. Into such a scene came Admiral Bishop with all his pomp, as the signals were being sent which directed the patrol boats to their stations.

When all was ready for the test, the patrol boats circled round the destroyer at a distance of a mile or so, and first one, then another, was signaled to send messages. First, the operators just graduated from the special radio-compass course were tested. Each man was given three bearings to report, one on each patrol boat. The first operator to be tested nervously entered the radio-compass house, wondering if his fate hung on his performance, and fumbled for a while with the somewhat unfamiliar apparatus. Finally he tuned in the patrol boat signal, and then, as he twirled the hand-wheel which rotates the coil, he became confused, and before he could gather his wits he realized that his minute was up and he had reported no bearing. On his second and third bearings he made a little progress, but the results were considerably in error. As he took off the head-phones and stepped out of the house, he said to the chief radio operator of the destroyer, "That don't sound nothing like what they give us to learn on in the course. It's all so different I couldn't make nothing of it." The next man, awaiting his turn, heard the remark and profited somewhat by it. He obtained a rough bearing each time just before his minute was up. Out of the ten operators tested, only three gave even a respectable performance.

Admiral Bishop had but a hazy idea of the nature of the test which was being made. When he first came on the

bridge, he got into conversation with the skipper of the destroyer, who fortunately had his officers well enough indoctrinated to operate the ship and carry on the test without his personal attention. The Admiral, having been on shore duty for several years, coming once more on ship-board, was reminded of cruises of long years ago. His talk became one of reminiscence about the good old days. It was not until the test of the ten operators was nearly finished that he became aware that it had begun. Commander Rich then explained to him just how the test was being conducted.

"You see the patrol boat out there is sending us signals. Down there in the radio-compass house aft, the operator is taking the bearing he gets on the signal as it comes in. He reports it to us here on the bridge by voice-tube. At the same time the navigating officer here is noting the actual bearing of the patrol boat by eye with the pelorus, to see whether the radio bearing is right."

About this time the last of the ten operators completed his test, and the results were displayed before Admiral Bishop, revealing clearly their unsatisfactory performance.

"Seems to me this radio compass doesn't show up very well in service conditions, Mr. Secretary," said the Admiral. "That's the way with a lot of these gadgets; they're all right on paper and in the laboratory, but on board ship they don't cut much figure."

"We have still to see the second part of the test," answered Mortimer. "The fault may be in the gear or in the operators; I want to find out which."

One of the men picked by the Bureau was then sent into the compass house. The signal was given for the sending to begin and in twenty seconds he reported by voice-tube, "Sixty-five."

"That looks like business," said the skipper of the destroyer. "How is it?" addressing the question to his navigator, who with his eye at the sighting vane of the pelorus followed the course of the patrol boat.

"She's bearing sixty-four," was the answer.

"Right to within one degree. Will he do it again?" said the skipper.

In five successive tests this operator reported the bearings with an average error of less than one degree, and his reports were delivered to the bridge with increasing promptness.

A signal to the patrol boats ordered the time of sending reduced to thirty seconds. The three remaining picked men then showed what they could do, and the greatest error was two degrees. On average barely eighteen seconds elapsed from the time the signals began till the report was heard on the bridge.

Admiral Bishop was now following the proceedings with interest and began to see what an accurate instrument the radio compass was when in competent hands, but his imagination was not keen enough to envisage the possibilities which it opened. The skipper of the destroyer was the first to propose a more spectacular demonstration.

"Let's have him steer us to one of the boats," he said.

A signal was made to the patrol boat on the port quarter to send signals continuously till further notice. The operator, when told what he was to do, listened a moment, revolving the coil and manipulating the switches, then called to the bridge, "Left rudder." The officer of the deck passed the word to the helmsman, and as the ship swung round till the signaling patrol boat bore dead ahead, the voice from the radio-compass house called, "Steady as you go." It looked like witchcraft, this guidance of the ship by an un-

seen and sightless power unerringly toward the source of the silent ether waves. As the patrol boat bore away to starboard, the operator kept the destroyer following her with her bow till, bearing down on her at eighteen knots, they were only a hundred yards from the little boat, when the skipper said, "Left rudder," and the destroyer shot past the smaller boat within a stone's throw.

Admiral Bishop, watching this exhibition, grasped for the first time what it really meant. As the unfailing precision with which the destroyer tracked her quarry became more and more apparent, his enthusiasm grew till his eyes fairly sparkled with delight. He shook hands with Commander Rich and congratulated him heartily on the splendid equipment which his division had installed in the ships.

After that it was only natural that, when the report of the test had been made, a motor-boat equipped with a radio compass should be set aside for the drilling of operators. And in the wake of this reform there naturally followed similar methods for the drilling of personnel in the use of hydrophones of all sorts, and all manner of special apparatus.

About a fortnight after this convincing demonstration on Chesapeake Bay, the *Sheridan*, a brand-new scout cruiser, was steaming back to the Boston Navy Yard after making her speed trial at Rockland, Maine. She was the first of a new batch of scout cruisers being rushed to completion, and in speed and every other important essential for this type of craft she was the last word. She was, of course, equipped with a radio compass of the latest model, and before the trip to Rockland this had been carefully tested and calibrated. In view of the importance attached to this apparatus since the demonstration on the Chesapeake, a radio gunner named Long had been sent by the Bureau of

Engineering to stay on board throughout this trip and check the work of the operators to be sure that both they and the apparatus were dependable for purposes of navigation. On the way to Rockland, Long had seized every opportunity of taking bearings on stations along the coast. The results had delighted the navigator, who saw that in every case he could depend on the bearings given.

Now, on the return trip, the navigator had occasion to be especially glad of the pains Long had taken, for a thick fog shut in soon after they passed Monhegan Island; every adjunct that could help him in his important duty of fixing the ship's position was more than welcome.

Late in the afternoon the captain, the navigator, and the officer of the deck stood on the bridge straining their eyes ahead into the dense, wet fog.

"Captain," said the navigator, "I think we'd better get some radio-compass bearings; my dead-reckoning shows us about ten miles from Cape Ann, and we don't want to go much closer without checking our position."

"Very well," said the captain, "you may instruct the radio room to get the bearings."

A signal was sent out, and in less than five minutes a full report from the radio room was handed to the officer of the deck on the bridge. It read as follows:

Cape Cod reports bearing 338° , Gloucester reports bearing 73° , Fourth Cliff radio compass temporarily out of commission; ship's own radio compass gives bearing of Boston Navy Yard transmitter 242° .

With alacrity the navigator plotted on the chart the position thus given.

"This shows us five miles south-southeast of our dead-reckoning," he said to the captain.

"Are those bearings dependable?" was the reply.

"Our radio compass has been giving us bearings accurate to within one degree without fail ever since we left Boston, and the shore stations are regularly dependable to within less than that. Besides, we have here three bearings and they check each other reasonably close, making the fix practically a certainty."

"Have them repeated," said the skipper.

"Aye, aye, sir."

The message was sent and in three minutes a report was received corroborating the previous bearings.

"How do you account for the error in dead-reckoning?" asked the captain.

"I don't know," said the navigator; "but you remember the seven destroyers that went aground on the Pacific coast in 1923 because they ignored the radio-compass bearings and trusted their dead-reckoning."

"That's right," said the skipper; "we can't afford to do that. What about sounding?"

"That wouldn't help us much here, the bottom's too irregular."

They looked at the chart together for a minute.

"Give us a course that will pick up the whistling buoy off Thatcher's Island from this last fix," said the skipper.

The navigator plotted the course, and the order was given, at which the ship swung a point and a half to the northward.

The speed of the ship had already been reduced to fifteen knots which on a ship in the habit of cruising at twenty-five, and capable of forty, seemed like a snail's pace. There was not much more than an hour of daylight left, and making a landfall in fog and twilight is nasty business; so the captain was loath to slow down any more. But the fog shut in thicker till the bow could barely be seen from

the bridge; a hundred yards marked the limit of visibility ahead. At fifteen knots a hundred yards is traversed in very few seconds; caution therefore constrained the captain to reduce speed to twelve knots. The lithe ship seemed to be crawling through the water.

Forty minutes passed. All eyes looked forward into the thick blanket of fog which seemed to paralyze the sense of sight. Captain and navigator paced nervously to and fro, looking now at the chart and then again into the gray void. The leaden sky began to darken visibly.

"We've gone eight miles since we changed course," said the navigator; "we ought to hear that whistle, we could hear it two miles in any direction."

"You'd better get some more bearings," said the captain.

At that moment the lookout in the bow shouted, "Surf ahead."

The captain sprang to the engine-room telegraph and jerked back the lever calling for full speed astern. In two seconds, which seemed an eternity, the whole ship began to shake as the turbines backed water with all their power. But a seven-thousand-ton ship even at twelve knots cannot be brought to a standstill instantly, and just as the breakers ahead became visible to the anxious eyes on the bridge, there was a hideous, grinding crash and shock.

To the skipper and navigator it was like the crack of doom — the death-knell of their careers, for with a horrible sickness in their hearts they knew they had driven one of Uncle Sam's finest ships ashore on an exposed and dangerous coast. The *Sheridan* was hard aground on the north end of a reef known as "the Salvages," just off the Rockport breakwater, some three miles north of Thatcher's Island.

The coolness, self-possession, and resourcefulness which these officers and those under them showed in handling this disastrous situation, which confronted them with overwhelming suddenness, was to their eternal credit and to that of the navy. Fortunately, the sea was not heavy and no difficulty was found in getting the crew safely off the ship. Salvage operations were promptly begun, and in a few days the *Sheridan* was pulled off the reef and towed to the Navy Yard where the extensive repairs and rebuilding of her bow were begun.

When the board of inquiry met to investigate the cause of the disaster, it was clearly revealed that the navigator's dead-reckoning had been correct, that the radio-compass bearings, which showed the ship to be five miles south-southeast of the dead-reckoning position, must have been in error, and that trusting these bearings and changing course to the northward had caused the ship to run aground.

Mortimer held a conference with Commander Rich.

"You can't trust these gadgets," said Rich, speaking of the radio compass. "There's a dangerous tendency among some officers to rely on a thing like this because it works well once. You see what happens:—one day it works beautifully, the next day it puts your best cruiser on the beach. If I were you I wouldn't waste another dollar installing such gear; it will be leading to a false sense of security, and will wreck some more ships."

With the wreck of the *Sheridan* staring Mortimer in the face, Commander Rich's logic seemed to him convincing. When Evans heard of this, he was sorely troubled.

"See here, Sam," he said, "this radio compass is a thing that has been working for twenty years, guiding our ships safely into harbors in thick weather. Look at the possibili-

ties it has in naval warfare! To go and scrap it because of one bad fix would be like throwing overboard all your guns because of one wild shot."

"Commander Rich says it's not dependable and is apt to cause more wrecks," said Mortimer; "and Commander Rich is one of the keenest and wisest men in the navy."

"He's a jackass if he tells you to give up this valuable instrument. There's some definite reason why those bearings were wrong, and the reason ought to be looked for and found."

"I don't like the way you speak of Commander Rich. I count on him in matters of practical engineering more than on almost any one."

Evans was silent a moment, frowning and fingering a paper-weight restlessly.

"I wish you'd let me go to Boston myself and examine the *Sheridan's* radio compass, and the one in the shore station at Gloucester that gave the wrong bearing. I believe I could find out something."

"I don't see that it would do any good," said Mortimer. "Besides, you're needed for your work right here in the Bureau."

"I'm doing nothing in the Bureau half so important as getting the truth on this matter. If I can find out why the apparatus failed and show how to prevent its failure in future, and thereby restore your confidence in it, I'll have done the biggest job for the navy that I can ever hope to do."

"If Commander Rich thinks it worth while to send you there, well and good," said Mortimer.

"Commander Rich would never send me. He has disliked me ever since that scene we had over the British vacuum-tube transmitter. He'd turn down a request like

that just for the sake of snubbing me, even if he saw the point in my going, which he wouldn't. The only way is to have orders come from some one above him. For God's sake, Sam, give this thing a chance. Let me get up there and see what happened."

His earnestness startled Mortimer and recalled the deep trust in his friend that he had always felt, and at last he yielded. It was arranged that Evans should receive orders which would enable him to visit the radio compasses around Boston and to go aboard the *Sheridan*, now being repaired there.

First Evans visited the station at Fourth Cliff near Scituate, the station which on the fateful day had been reported out of commission. He learned that during the entire day of the wreck the operators had been unable to make the apparatus work. The next morning a careful examination had revealed a loose connection which had resulted in an open circuit. It was the kind of thing that might easily result from undue haste in installing the gear.

At Gloucester he questioned the operators closely. They could not account for the error in the bearings they had given to the *Sheridan*, both of them having proved to be some sixteen degrees off. The apparatus had been giving accurate bearings for years; they used it on that day just as they always had, and since that day it had been tested and recalibrated, and had proved to be in perfect condition and giving just as accurate bearings as it always had. Evans examined the apparatus himself with the greatest care. Nothing was amiss; it certainly was in perfect working order and adjustment. He was mystified; he could find no possible clue to this sudden and disastrous lapse. At all events, the gear was working well now, and the operators on their guard against mistakes.

On the *Sheridan* Evans found the radio compass apparently in good order. But when he had signals sent from a station near by and tested the gear in actual use, he found the bearings which it indicated always eight degrees to the right of what they should be. He then examined the circular scale from which the readings were taken and found it eight degrees out of alignment with the coil.

"That's a rank bit of installation," he said to the operator in charge of the apparatus. "I thought you'd been getting good bearings with it all along the coast before you went aground."

"We did," said the operator.

"How could you? The scale is eight degrees out."

"It must have slipped."

Evans took hold of the scale and found it securely fixed in position. He looked carefully for any possible obstruction which might have caught on it as the coil was rotated and forced it round on the shaft, but he found none.

"I don't see how it could have slipped; it's on tight enough," he said.

The operator shrugged his shoulders.

"Are you sure no one made any adjustments here that day?" Evans asked.

"I know I didn't, and I'm pretty sure my mate didn't, but I'll ask him. We were the only ones in here except Gunner Long who came from the Bureau to see that the gear was working. He was here in the shack and sent me to get some wire or something from the main radio room an hour or so before we struck. I was gone only two or three minutes, and that was the only time I was out of the shack all the forenoon. I stayed here till the order came to abandon ship and we all got into the boats."

His mate, the other radio-compass operator, was sent

for, and corroborated his story as far as his own watch was concerned. Evans was baffled. But it was a simple matter to set the apparatus right. He reset the circular scale in its proper position; and he nearly broke his screwdriver tightening the set-screw which held it in position, to be sure it did not "slip" again.

When he returned to Washington to report on his findings, his task was not easy. Elkins, with whom he discussed the matter, was entirely sympathetic. A peculiar combination of circumstances had wrecked the ship. The one time in years when the Gloucester station failed to give accurate bearings happened to coincide with an unaccountable slipping of the scale on the *Sheridan's* radio compass. Such a combination of mishaps was not likely to occur again in a generation. It would be absurd to abandon anything so obviously useful because of it. Mortimer was still skeptical, and inclined to follow the advice of Rich, but Evans drove home his point with such earnestness and force, as they discussed it by Mortimer's study fire, backing up his argument with Elkins's concurrence, that Mortimer finally said he would allow installation of the gear to continue for the present. But he considered it on trial; any more serious failures or disasters, and the radio compass would be discarded as far as any active use of it in warfare was concerned.

One day, soon after his return to Washington from Boston, Evans talked with Commander Barton of the Bureau of Intelligence about the peculiar mishap, and his failure to explain just how it occurred. When he mentioned his investigation of the Gloucester station, and finding the apparatus there in perfect order, Barton said, "Did you ask them who had been in the station that day or the day before?"

"No, I didn't think of that," said Evans; "I was looking for trouble in the apparatus."

"I should say that was the first thing to find out," said Barton.

That evening Evans did some hard thinking, and went to bed a wiser man.

Barton sent one of his best officers to Boston to visit the stations at Gloucester and Fourth Cliff, and conduct a bit of research along somewhat different lines from those Evans had followed. What this officer told Barton on his return he kept to himself. For a long, long time he did not speak of it to another living soul except Admiral Rallston, Chief of the Bureau of Naval Intelligence.

As the winter months wore on, the navy's main task was escorting the great convoys across the ocean and thus enabling the armies of Northern Europe to hold their line. But the navy was preparing for larger things than escort duty. The enemy submarine base at the Azores proved to be a constant menace; from it submarines would come out in force, and sometimes succeed in sinking ships and escaping unharmed from the depth charges of the escort.

At Punta Delgada, the capital port of the Azores, the enemy had for some years been building a giant breakwater to create a harbor far bigger than that which sheltered American destroyers and submarines in 1918 when this port was in friendly hands. Work was now being rushed to complete this greater harbor, and with it docking facilities that would make the base more efficient in the maintenance of extensive submarine operations.

The nearest Allied base to the Azores was Berehaven on the Irish coast, and from here a British airplane carrier went out from time to time, cruising southwest to within two hundred miles of Punta Delgada, whence just before

dawn she would launch into the air two or three high-speed aeroplanes equipped only with their machine guns and cameras of the most perfect type for long-distance photography. When the first rays of the rising sun struck the harbor and port works of Punta Delgada, revealing all details through the contrast of light and shadow, with a brilliance of relief which is lost when the sun is high, these planes, soaring at an altitude too great for the eyes of the drowsy watchers, would take their pictures and fly away unseen to the waiting mother ship. The optical system in these cameras was a marvel of design, and when the photographs were studied under the lens in London and Washington, it was not difficult to follow in detail the work of perfecting the submarine base.

By the end of the winter this photographic study had revealed that the breakwater was practically complete, and the docks almost ready for the opening of more extensive submarine operations; moreover, coast-defense guns and vast stores of ordnance and engineering material had been accumulated, and all was in readiness for the building of powerful defenses which would make the seizure of the port difficult in the extreme. Now was the time to attack, before the great coast-defense guns were mounted and ready for use. The American Navy, which had suffered from the peace-time shortage of personnel, was now adequately manned and ready for aggressive action. A consolidation with the British and French ships was effected, and in March the attempt was made to seize Punta Delgada. The Mediterranean Powers deemed it unwise to risk their capital ships for the defense of this point, and kept them safe in the Mediterranean. After a brief resistance, the Azores fell into the hands of the Allies. The enemy had done the lion's share of the work of preparing a

first-class base with the strongest kind of defenses. The materials were there, and it was a comparatively easy task for the Americans and British to assemble them after their own pattern. The loss of this valuable base was extremely annoying to the enemy, but as long as their fleet remained intact within the shelter of the Mediterranean Sea they felt secure in their control of the great resources on which they pinned their faith.

Following the advantage gained by possession of the Azores, the Allied forces soon took Madeira and the Canary Islands, both bases being less strongly defended than the Azores. The Cape Verde Islands thus were virtually cut off from their base, and surrendered before long without resistance.

CHAPTER V

THE STORM-CENTER MOVES EASTWARD

THE loss of their island bases seriously hampered the enemy in their submarine warfare on the great stream of trans-Atlantic shipping. Submarines were now based on Lisbon and Gibraltar, and while they were still able to harass the merchant ships of the Allies, the sinkings were materially reduced, and the prospect of keeping Northern Europe supplied with the sinews of war became much brighter. Possession of these bases also enabled the Allies to conduct anti-submarine operations with destroyers and submarines in a way that had hitherto been impossible for want of any base near the focus of activity.

The first time Evans dined with Mortimer after these islands had come into the possession of the Allies, this important development naturally led them to talk over the general problem from a new angle.

"Broadly speaking," said Evans, "it is in a way a problem of morale and numbers against resources and wits. We have far better morale and slightly superior numbers. They command the resources of all Southern Europe, Egypt, and the East, and they still have pretty free access to those of South America. In this respect, unless we can cut them off from South America, they have an appreciable advantage over us. As to wits, I don't mean that the Nordic peoples as a whole are inferior to them, but theirs is the advantage of well-laid plans and a marvelous centralized control. They've been planning this thing for fifteen years, and they've done a devilish good job of it. We have wits, but ours are not yet coördinated.

"Specifically, our problem is, first, to sink enough of their subs to ensure the flow of munitions from the Western Hemisphere to Northern Europe; that will enable us to maintain our present status; second, to engage and destroy their fleet, and thus break their control of the Mediterranean. That will be the hardest thing to do, for they don't want to give us a crack at it; they won't take a chance of battle unless they can feel sure of most favorable conditions; but if we can smash their fleet, the game is won."

Mortimer listened thoughtfully, nodding his head in acquiescence as his friend talked; but Evans interrupted himself by saying, "Well, here I am giving my elders and betters a twopenny talk on the cosmos."

"Don't worry about that," answered Mortimer; "it helps me to see the broader issues and clear my head of the mass of administrative detail. Go to it and give me some more."

"Well," resumed Evans, "as to the submarine problem — we're in a position to go after them now. Obviously one of the first things to do is to put the very best radio compasses we can on shore stations at Punta Delgada, Madeira, and the Canaries, fitting them with first-rate amplifiers so that we can pick up subs as soon as they come out of Lisbon or Gibraltar. Then we can follow their movements by taking cross-bearings on them every time they use their radio, just as the British did with the German subs in the old days."

"You know, I still have my doubts about this radio-compass business," put in Mortimer. "Nothing has been done with it to restore the confidence of either Commander Rich or myself since the *Sheridan* affair. I still consider it on trial, and question the wisdom of spending much money installing such stuff on the islands."

"No one has bothered to tell you what has been done," said Evans, "but the fact is that the radio compasses all along the coast are continuing to give accurate bearings to incoming ships whenever the weather is thick, just as they have for the past twenty years, and the skippers for the most part continue to trust them. Anyway, this is a different issue. It doesn't involve depending on the bearings for navigation of our ships; it is a matter of information about the enemy, and we can't afford not to use it. The Bureau of Operations is counting on the use of these shore stations, and recognizes also the importance of working up coördinated hunting groups of destroyers to pick up the scent of the sub by crossed radio-compass bearings, and then, having thus located her roughly, to run her down with hydrophones.

"Now the shore stations have the longest range; they'll spot a sub nearly a thousand miles away, but since their work is long-distance triangulation, they'll place her only roughly. This will serve very well to tell the destroyers and chasers where to go to look for her, but by the time the information is transmitted and the hunting craft have got there, the sub may be too far away from the designated spot to find her with hydrophones. It is in this intermediate stage that the radio compasses on the destroyers themselves will come in. These have less range than the shore stations, but more than the hydrophones. Cruising in line, the destroyers may, by quick work, get cross-bearings on a sub sending signals anywhere within fifty miles, and thus locate her to within a mile. Then there's a fair chance of picking her up with the hydrophones or magnetic detectors after she has submerged; and once that is done there's a fair chance of covering her with a pattern of depth bombs, if the team-work is good.

“Now that sounds all very pretty, here by the fireside. But the pirate will have sense enough to fear these tactics, and will cut his messages down perhaps to one or two letters at a time, which won’t give the boys much chance for accurate bearings, no matter how quick they are. Then, he too has hydrophones, and when he hears us coming, he’ll slow down till you can’t hear him unless you’re almost on top of him. Still, with all these difficulties, it’s worth while playing that game for all there is in it. It may get us a few subs, if we keep it up on a big enough scale; even if it doesn’t, it will bother the sub and cramp her style, and it will give our boys the finest kind of drill.

“Now, there’s another matter which the difficulties of hunting with destroyers brings to my mind. In the war with Germany the chasers used to run their drifting patrols and hunts with all their listening gear, and once in a while, probably even less often than they thought, they picked up the sound of a sub. Then it was ‘up tubes’ and give chase; then ‘down tubes’ and listen again; a short burst of speed, then a dead stop, for they couldn’t listen under way. The chases had to be short, for Fritz could change course and speed, and then, while they were rushing to where they thought he was, they’d lose him. It was a sort of a hare and tortoise race, and you remember who won that. Our chasers to-day are somewhat faster and have much better hydrophones than those of 1918, but the problem is still much the same.

“Now, there’s a group of young officers in the Bureau of Engineering that have studied the history of those chaser maneuvers of 1918, and have put their heads together and worked out what looks to me like a real solution of that difficulty. More than one of the chaser captains of that time have said that, if they could have continued to listen

instead of having to attack, they would have kept track of the sub's whereabouts much longer than they could in the intermittent pursuit. Taking their cue from this fact, these officers have worked out a scheme which enables the listeners to keep on listening, and then to delegate other vessels to go to the spot they designate and surround the sub as a seiner surrounds a school of mackerel — with a string of nets. Their plan is to develop a fleet of ships like those that laid the great North Sea mine barrage — ships that will be fast and will have machinery for laying a net at very high speed. A sub can cut through an ordinary net and escape, so they have worked out plans for a net that will give notice if she tries it. It is to be studded with small telltale bombs just big enough to raise a fountain, but not big enough to add much to the weight and size of the net. These bombs, each in a section a hundred yards long, will be exploded by an electrical device if the sub touches any part of that section. It won't hurt the sub, but it will tell you where she is, and you'll have boats on hand with depth charges to do the hurting. The point is to establish quickly a barrier around the sub through which she can't pass without giving away her position.

"These young officers have been fearfully keen on this thing and have worked out practical plans for machinery that will pay out the net at a speed of six knots, and the electrical gear for setting off the bombs.

"You can't anchor the net, for the ocean's too deep out there; it must be suspended from buoys. It needn't reach down more than about three hundred feet, for no sub could dive under it at that depth without being crushed by water pressure. The tactical scheme is to have these boats, eight or ten of them, lie in wait at a central point with groups of drifting listeners scattered all around them, say, twenty

miles away. When a sub is heard and located, the listeners call the net-layers by radio, and they go to the spot at a thirty-knot speed. As they approach they soon drown out the sound of the sub, but their speed and number enables them to surround the area in which she is known to be, for she won't have time to go far from where she was last heard. Paying out their nets, they hem her in and keep the ring of nets closed round her till the area is raked with trailing wires and other electromagnetic detectors which will enable the chasers to concentrate their depth charges with the certainty of a kill."

"That sounds like the most constructive — or rather artistically destructive — proposition I've heard yet," said Mortimer with enthusiasm. "What are they doing about it? Have they submitted it to the Bureau Chief?"

"They've tried to, but they couldn't get much attention paid to it."

"Why not?"

"I've tried to find out why, but I can't quite make it out. On the face of it the trouble seems to be the usual conservatism and inertia about taking up anything new. Did you ever read the article Sims wrote on Military Conservatism?"

"No," said Mortimer.

"Well, in that, he showed how every great advance, such as gunpowder and steam, met with opposition, and chiefly from the men at the top, who, being the older men, had quite naturally lost the mental flexibility of youth. It may be just another case of that. Admiral Bishop is a conservative old buck. But then I suspect this project has never come to his attention. I think it's been stopped lower down, and I fear there may be jealousy or politics or something else worse than conservatism involved in this."

"Give me the names of the men who have developed the

scheme," said Mortimer, "and I'll dig it out. I'll make old Bishop find out about it and bring it up before the General Staff. I needn't tell him how I heard of it; so nobody will get in trouble."

Mortimer lost no time in bringing this matter before Admiral Bishop. The old man was averse to bothering his head with any new, wild-cat schemes, but, yielding reluctantly before Mortimer's insistence, did secure from the authors of this one an outline of it for consideration by the General Staff. At the meeting of this body a number of objections were raised by the more conservative officers. The expense would be out of all proportion to the prospect of success; nets could never be paid out fast enough to surround the elusive sub; the thing had never been done — was unheard of; these new-fangled schemes never did work, anyway. With his lawyer's skill, Mortimer questioned them as to all the difficulties in the way of the project, till he felt that some of the more progressive members were in favor of it, and the others weakening. Then, following this advantage, he showed them how lacking in the convincing quality all the objections had been, and virtually demanded and finally obtained their acquiescence in putting the plan into operation, overriding the final objections of Admiral Bishop in a way that caused this officer to be visibly incensed.

Engineering talent was set to work on the details of the scheme, perfecting the net studded with tiny bombs, and the machinery for paying it out at high speed from the moving ship. This latter being a purely mechanical problem, there was no lack of inventive skill available for bringing it to the production stage in record time. Provision was made for the safe recovering of the nets without detonating the bombs. Five fast liners, built and building, were taken

over and rearranged for installation of additional boilers and the new gear. Three new ships were started building, specially designed for this service. Thus it was estimated that, during the autumn, eight ships capable of thirty knots would be ready to give this project a trial.

Mortimer requested Admiral Bishop to institute an investigation to find out why this important suggestion had been side-tracked. This quest proved most confusing; the original copy of the communication could not be found. Several engineer officers recalled having seen it, and one said he thought he had turned it over to Commander Rich to get his opinion. Commander Rich, on the other hand, said he was sure he had never seen it. In the end it was concluded that the paper had been pigeon-holed and then lost through the carelessness of some yeoman.

Mortimer told Evans the result of this investigation. Evans listened attentively, frowning as the unsatisfactory conclusion was reached. For some time he sat in silence; then he spoke:

"Sam, it's a beastly uncomfortable thing to come to you with a criticism of my superior officer, but I don't see how I can conscientiously dodge it. For some time I've been getting uneasy about Commander Rich, and this thing makes me more so."

"What do you mean?" asked Mortimer.

"I doubt his loyalty."

"That's a pretty serious thing to say. What evidence have you?"

"Not much, I admit," said Evans. "But do you recall that business about the British vacuum-tube transmitter? There seemed to be a peculiar discrepancy between his point of view as represented by the Admiral, and that which he himself took in the final show-down."

"That was just a misunderstanding," said Mortimer. "You're too suspicious, Jim. Just get that out of your system."

"Maybe I am. Just the same, I'd keep my eye on him if I were you."

"That's perfect rot," said Mortimer. "Rich is one of the ablest and most dependable men in the service; the more I see of him the better I like him. You'd better quit suspecting him, and give him a little loyal support and coöperation yourself."

Evans said no more; there seemed nothing more to say. He had a nasty feeling inside, and a change of subject seemed indicated.

Another project, made possible by the capture of the Azores, also engaged the attention of the Navy Department at this time. The completion of the new breakwater and harbor works at Punta Delgada had now made this an ideal base for destroyers, chasers, and other submarine-hunting craft; but even this harbor was not nearly big enough for the entire fleet of battleships and cruisers. If the fleet had to lie at anchor outside the harbor there must be some protection against attack by enemy submarines. Now, unless the place could be made safe for the entire fleet, its value as a base for anti-submarine operations was seriously impaired, for if a fleet of chasers set out from Punta Delgada to hunt in the direction of Gibraltar and no powerful ships were within call, a detachment of enemy cruisers could come out and destroy them. Destroyers supported by fast scout cruisers could sally forth in comparative safety, for their speed would enable them to retreat under the cover of the coast-defense guns if pursued by a superior force of the enemy. Submarines, too, could operate from the Azores in comparative safety, for they could hide at will.

But the large flotillas of chasers now being commissioned and manned, good for only sixteen knots, would be exposed to grave danger if they operated far enough from their base to do any good.

It was at this point that the services of Herringham in Constantinople became a source of safety and strength. The combined fleet of the Allies could lie at Brest, and if at any moment, day or night, a force of enemy ships weighed anchor at Gibraltar, and started out through the strait, word of it would at once reach the Admiral at Brest, and in less than two hours the Allied fleet could be under way in search of them. This arrangement made it possible for chasers and other patrol craft, too slow to escape from enemy cruisers, to operate in waters nearer to Brest than to Gibraltar, but outside this area their helplessness in the face of attack by cruisers rendered their search for submarines unwise.

For this reason, as well as because of the strategic position of the place and the greater ease with which secrecy concerning the activities of the fleet could be maintained at such an isolated spot, it was most desirable to develop a base for the whole fleet at the Azores rather than in French or British waters. A plan was therefore developed to enclose the entire area between the islands of Saint Michael's, Santa Maria, and Formigas, the most easterly group of the Azores, with a barrier of heavy nets reinforced with mines, and a system of detecting nets of wires which would at once reveal the approach of a submarine attempting to break through, and tell the observer at a central station on shore the very point at which the approach was made. Thus there would be a sheet of water roughly thirty miles by sixty, protected from attack by sea, with a fair anchorage for the entire fleet just south of Saint Michael's. It was a

large engineering project, but not too large for the end to be gained. This, it was estimated, would take till the late summer for completion.

In the mean time, Punta Delgada became the storm-center of all the patrolling and submarine hunting by swarms of destroyers, submarines, and seaplanes. Weather stations were established here and in all the other captured islands, manned by officers trained for this duty by Professor Jeremy, now holding the rank of commander.

As the spring wore on and the men on the patrolling craft learned how large the ocean was and how seldom any trace of a submarine could be found in its expanse, enthusiasm for the chase gave way to ennui and discouragement. A little success was sorely needed to put heart into both officers and men, worn as they were by the tedium of the long, dreary watches at sea.

Late in May, Evans and Mortimer motored out into the country some miles from Washington, and went for a walk together.

"I think I'm rather wasting time here in Washington," said Evans. "I believe I'd find more to do now in the Azores."

"I don't see how we can spare you here, Jim," answered Mortimer. "Seems to me we need you in the Bureau to help all these engineering developments; — not to mention your glittering generalities which I find rather helpful now and then."

"I guess you can get along all right without any 'glittering generalities' from me. As for engineering developments, I find that I can't get much of anywhere with Rich in charge of the Radio Division."

"Still at odds with your chief? Forget it; buck up, and play the game with the organization as you find it."

"I can't help it," said Evans. "There's no use my trying to work here in the Bureau with him. He apparently stands for efficiency and progress; he agrees heartily to every constructive suggestion for improvement, yet somehow the necessary orders don't get issued, or, if issued, don't go into effect. I keep feeling that my hands are tied. But in spite of all this we've got enough material out to the Azores, so that if I could get there, I could shape it into what I want, unhampered by the obstruction that's hindering me here. I know how it is from what I saw in 1918. There's always less red-tape at the scene of actual warfare than there is in the Bureaus here. I'm sure that if I can get to Punta Delgada I shall be more nearly on my own, and can work to better advantage. There are lots of engineering possibilities there, and I can fix things up to my liking without this officious interference from above.

"Besides, it's at Punta Delgada that the communication storm-center will be from now on. I feel sure I can be more useful tinkering with the apparatus in the fleet, and seeing that the boys use it right, than I can imparting spare calories to a swivel chair here in Washington. In particular, there are the radio-compass shore stations that we are installing in the various islands; the regular work of installation is going on all right, but there's always a possibility of their not working as they should, and it's really a physicist's job to take care of that sort of thing. Then the apparatus must be accurately calibrated, and the personnel taught to use it quickly, and the machinery for transmitting the intelligence rapidly to headquarters and thence to the ships that can use it, must be organized, and organized well. For all that sort of work, I think it's time to be moving a good many of your men of engineering ability out to the Azores where things are going on."

"There's no doubt," said Mortimer, "that there'll be plenty of engineering work to be done out there, and more and more as time goes on; and I can see the importance of having you as a physicist look over those radio compasses. But I should like to be able to keep in touch with you, and frequent messages from a warrant officer in the fleet to the Secretary would look kind of funny; you might get uncomfortably snubbed by some one."

"I think I can get round that," said Evans. "I'll work out a method of dropping you a hint or a glittering generality now and then without even ruffling the surface. I learned one or two tricks from those fellows in London about faking telepathy. We could arrange a flying trip home if the occasion arose."

"Well," said Mortimer, "you've got away with lots of things a warrant officer's got no business to, and they haven't had to court-martial you yet. Go ahead and fix up your secret code and make your plans, and let me know when you're ready to start."

A few days later they met again. Evans reported himself ready to leave for the destroyer flotilla.

Mortimer said: "I wish you would look over the *dramatis personæ* in the fleet and size up who's who as far as you can, especially when the main fleet gets out there, which will be some time in August. It's hard for me to size them up from my desk in the department. If you are convinced that there's anything radically wrong with the men at the top, give me one of your magic hints and I'll send for you to come and tell me about it."

They conferred at length over many phases of the great problem, arriving at a close and harmonious understanding on the main points of the task confronting the navy. It was arranged that Evans should be temporarily attached to a

new destroyer that was about to sail for Punta Delgada, and on arrival, be attached to the mother-ship of the destroyer flotilla, a vessel similar to the old *Melville* that lay at Queenstown in 1918, equipped with repair shops and other facilities for the care of the destroyers. Here he was to be technical assistant to the radio material officer; and in a letter from the Bureau of Engineering it was explained that he was to visit the shore stations and see that everything was installed according to the latest engineering developments.

"What about your method of communicating with me?" asked Mortimer.

"There are two expert radio aides (civilians) in the Bureau of Engineering, who are highly intelligent and pre-eminently discreet," answered Evans. "Their names are Tompkins and Rand. Keep those men on the job in the Bureau, and if I have anything to tell you they'll pass it on to you."

"How will you manage that?"

"I'll fix it somehow. All you'll have to do is to keep those two men there. If anything happens to either of them, notify the Intelligence Bureau at once, and tell them to lose no time and spare no pains probing the matter; then watch your step. If one dies, let the remaining one choose his successor and teach him the technique."

Four days later Evans reported on board a new destroyer setting out to join the flotilla at Punta Delgada. During the first part of the journey she assisted a cruiser serving as ocean escort for a great convoy of merchant ships loaded with munitions and food for the armies of Northern Europe; but when in mid-ocean, she was detached from the convoy, and, speeding up to twenty knots, laid her course for Punta Delgada.

It was in the middle of a beautiful June afternoon as the destroyer was gliding over a glassy sea bathed in sunshine, when the lookout first sighted the cloud-capped mountains of Saint Michael's. As they approached and coasted along the southern shore of the island, the clouds rolled away revealing the soft yet striking outline of the range clad in semi-tropical verdure. Presently, some miles ahead, they could discern the town of Punta Delgada shining in the afternoon sun; then across the breakwater the masts of many ships, destroyers, and auxiliary craft. The town took shape, scattered over the steep, sloping hillsides around the old harbor. Nearer they came, and at last slid smoothly through the opening in the net into the great new harbor. Before them spread a panorama that might well gladden the eyes of all on board after nine long days on the barren ocean. Gay-colored houses in pink, yellow, and white stucco, in brilliant relief of sun and shadow, breathing an Old-World atmosphere, lined the shore, while strange and picturesque trees and gardens dotted the slopes receding to the capricious outline of the green hills beyond. It seemed as if a magician's wand had conjured out of the sea a city of a far-off age and of another world. And in the foreground, tied two by two at mooring buoys, the long, lean American destroyers spoke of the grim business of war.

To Evans, drinking in the picture before him, it was hard to believe he was not in some strange dream. And being more impressionable than most men, his mood became that of a child witnessing for the first time a scene of fairy-land artfully displayed on the theatrical stage.

To make the incongruity of the whole scene complete, a large American seaplane, returning from patrol, came whirring down out of the sky and lit on the harbor in a great splash of white foam, then taxied to her mooring.

Rowboats, manned by natives of the town and loaded with pineapples and other tempting commodities, swarmed around the destroyer as she tied up to her designated buoy.

The sunlight on the hills and houses turned golden and then red, and finally disappeared. A pink sunset faded into twilight, and just before dark six destroyers cast off from their moorings, slipped out silently through the opening in the net and headed to sea on a hunting patrol.

Early next morning Evans went aboard the mother-ship of the flotilla and presented his orders at the Flag Office. When they had received the endorsement of the Chief of Staff, he was instructed to report for duty to Lieutenant Larabee, the radio material officer, a man of twenty-eight, whose technical assistant he was to be.

"Gunner Evans," said Larabee. "Yes, we had a letter about you from the Bureau. I understand you have been assisting in some of the newer engineering developments there, and that you've had previous experience in a physics laboratory."

Evans assented.

"There's one thing you'll have to learn on this job," continued Larabee; "conditions afloat are very different from those in a laboratory on shore; a lot that goes there won't go here."

Evans received the advice with thoughtful deference, and as they discussed the problems before them, he studied with the closest scrutiny the mentality of the young officer, nearly twelve years his junior in age, but three grades his senior in rank. Neither in this conversation nor for long afterward did Larabee discover that Evans had served many months as a radio operator on a destroyer in the war zone during the war with Germany twenty years before,

nor did he dream that his age was such as to render this possible.

In pursuance of the suggestion Evans had made to Mortimer, several men who had played important parts in the engineering developments at home were soon transferred to Punta Delgada — not without remonstrance on the part of those who had come to rely on their efficiency — and were now absorbed in the increasing organization at this point. In this way preparation was made to bring the engineering skill of the service into play at what would soon be the center of all operations. Among others a chief radio electrician of exceptional skill and understanding, a man Evans had picked before leaving Washington, to be his assistant, arrived and reported as he had done, for duty under the radio material officer.

On board the mother-ship there was a small radio laboratory or test shop where experiments with new apparatus could be conducted. Evans saw its present limitations and future possibilities (provided more space was available), possibilities of work of the first importance in the perfection of the technique of communication in all its complex phases. Larabee, eager to make the radio material service of the flotilla as good as possible, welcomed the assistance of a handy and competent radio gunner, and began to put up a strenuous fight for the needed space. The ordnance officers wanted the space and objected, and the executive officer backed them up. But at last, spurred on by his increasing sense of the importance of what he sought, Larabee succeeded in showing the ordnance officers how they could manage without the coveted space, and in convincing the executive officer of his need of it. Then Evans had a free hand to equip the laboratory to his heart's content. Cabled requests went out to Washington for new supplies and

apparatus, but during the necessary weeks of waiting Evans was never at a loss for methods of utilizing such crude materials as he could pick up in the machine shop or on the scrap-heap.

Nor was his time all spent in this laboratory: his duties took him aboard nearly every ship in the flotilla, where he scrutinized the condition of the apparatus, questioned the operators, stimulated their interest, and set them thinking as they had never thought before. Most of the destroyer skippers noticed an increase in efficiency in the handling of communications by the men under them, and some patted themselves lustily on the back for it. It was not long after his arrival that he had made the round of the radio-compass stations on shore, not only in the Azores, but also at Madeira and the Canaries. On these excursions he tested and calibrated each station with a destroyer circling at a distance of two or three miles, sending signals; and he spared no pains to satisfy himself that the operators had a thorough understanding of their duties, and knew full well that on their vigilance rested large issues.

But after his first general survey of the flotilla as regards its efficiency in communications, Evans found time for further research which this survey had suggested to him; and he was never so happy as when thus engaged. Sometimes, as a result of an idea either in the realm of electrical theory or of tactical expediency, the need of intensive development of new or modified apparatus would appear; then an engineering research, which in peace-time would require months, was completed in five or six days. Evans in his dungarees would work day and night with his skilled assistants, often risking death among wires charged with a thousand volts or more. No time was spent writing detailed protocols of experiments. Results were carried in his head

with only occasional notes scribbled on scraps of paper or on the walls of the test shop. The radio chief who assisted him became fired with his enthusiasm and worked ungrudgingly for long hours which would ordinarily make most petty officers grumble loud and long.

In the warrant officers' mess Evans was more often the listener than the speaker. When occasion offered, he would draw out the older men on the specialties in which they were expert, and often would guide the conversation into a discussion of coördination, in which each man was stumped to show how his particular duty fitted into the organization of the navy as a whole, and thereby was led to see his own function in a new light, thus acquiring an increased sense of his responsibility. There was one old boatswain named Jenks nearly sixty years of age, a veteran of both the Spanish and the German wars, a relic of the old type of seaman that is all too scarce. Evans delighted in leading him to open his rich storehouse of experience, and in drawing from him his old-time navy lore. Jenks in his turn found Evans sympathetic, and talked with him as he did with few other men, revealing a shrewdness and wisdom which had often stood him and the navy in good stead.

To the mess as a whole Evans remained something of an enigma. They saw him in his room manipulating a slide-rule and jotting down figures on a scrap of paper, softly humming a tune to himself the while. Few of them had ever seen a slide-rule, and from his frequent use of it they inferred that he had had more schooling than most of them; but in general they found him rather uncommunicative as to his past history.

For exercise and relaxation Evans frequently went ashore and took a walk among the hills. On his first shore liberty the sense of foreign picturesqueness came over him more

than ever as he approached the antique landing in the center of the town, where at the water's edge was an array of architecture so different from anything in the Anglo-Saxon world. On shore he found himself in a strange world indeed. Strange sights, sounds, and smells greeted him everywhere; barefooted men were leading donkeys laden with goods about the narrow, dirty streets. And after flooding his senses with a riot of impressions of an alien world, it was with a distinct sense of homecoming that he returned to his quarters aboard the mother-ship of the flotilla.

He had not been at Punta Delgada long before he discovered a spot easy of access, walled off from the town, in which, among the most restful and soothing surroundings, he could give himself over to relaxation or thought. This was the ancient Borge garden, created by one of the Portuguese nobles who flourished on these islands in the far-off days of their feudal prosperity. Now neglected, overgrown with weeds, this antiquated paradise reflects its former glory with a stronger appeal than if it were kept up with a lavish hand, much as the ivy-covered ruins of England tell their story all the better for their ruined state.

In the Borge garden there are trees of the strangest, most fantastic character — trees with pudgy leaves, trees with shapes one would never believe could really exist. Here and there are deep grottoes with giant tree-ferns growing from their depths; zigzag stony paths lead down into them or through tunnels or over bridges artfully contrived to conceal as far as possible their artificial nature. Fascinating glimpses into the depths of tropical greenery are thus given emphasis by their skillful setting. Surmounting the rest of the garden high up on the slope is an ancient watch-tower commanding a view of the sea. Crumbling steps over-

grown with weeds lead up the side to its summit. Beside it stands a majestic and venerable tree, a conifer of the cedar or cypress group, which must have stood there for centuries casting its deep shade on the old watch-tower. Framed under its great lichen-covered branches, the wide expanse of the blue ocean makes the fairest of pictures — one on which the eye can rest and never tire.

Evans made friends with the old barefoot gardener who opened the great gate in the garden wall, and by signs and gestures allayed his suspicions till the old man admitted him cheerfully whenever he knocked.

Here, when his brain was taxed and overwrought, he would seek the quiet of the garden and give himself over to rest or meditation. Sometimes he would wander through the depths of the great fern grottoes, but oftener he would climb to the top of the watch-tower and sit gazing off over the blue expanse of sea, as perhaps the lookout had done in other wars of a bygone age. Many a problem in the borderland of science and strategy which harassed him in the turmoil of life aboard ship yielded a solution to his mind unfettered and free as it was when he sat on the watch-tower.

The Borge garden was inhabited by numerous small birds that sang melodiously among the trees and shrubs, and so doing enhanced immeasurably the charm of the place. Evans was no ornithologist, but he was a lover of all wild life, and especially of birds. He took with him to the garden liberal stores of crumbs which he scattered on the ground about him. Little by little the more venturesome of his feathered friends grew accustomed to his presence, and would light on the ground beside him, till finally one or two actually came and ate from his hand. He would talk and whistle to them, and in course of time, whenever they heard his voice, they would fly to the old tree by the watch-tower

and there await the social feast which he never failed to bring. He in turn found a deal of cheer in the companionship of his bird friends. And so it was that when disheartened or exasperated with inertia and officiousness, the snarls of red-tape in which supply clerks entangled much-needed gear, or the stupidity and indifference of radio operators whom he tried to instruct, he found in the little birds of the garden a solace that made life more livable, and more than once helped him over the hard places.

CHAPTER VI

THE HUNT

DURING June and July, Evans devoted a liberal share of his attention to the radio-compass problem. He felt that the apparatus was still on trial. A slight lapse might cause this instrument of untold possibilities to be lost to the navy because of the *Sheridan* disaster and Rich's subsequent effort to discredit the apparatus in Mortimer's eyes. Going frequently aboard the destroyers, he looked over the apparatus and talked with both the operators and the officers. With the former he discussed all details of operation; with the latter, the prospect of using it effectively in the search for subs; in talking to both groups he made sure that they understood what was necessary for all hands to know.

The problem of submarine destruction was even more difficult than in the war with Germany, for then the German U-boats to reach their hunting ground must pass through British waters so narrow as to render the mine barrage feasible and to facilitate a considerable concentration of anti-submarine craft. Now the submarines emerging from Gibraltar and Lisbon, both powerfully defended, could far more easily lose themselves in the broad Atlantic.

From time to time when they attacked convoys the submarines were sunk or damaged by the escorting destroyers. But the numbers dealt with in this way were not nearly enough to give the needed protection to shipping. The chasers now and then picked up suspicious noises with their listening gear, but seldom were able to follow them to a successful issue.

Hunting squadrons of destroyers, three in each squadron, were going out and sweeping the seas, but encounters with the enemy were so rare as to be almost negligible. As of old, the search was long and tedious. Whole days of seeking in vain for a trace of the enemy were telling on the men. They were growing stale and losing their enthusiasm, and so the efficiency of their vigils waned. Encouragement was sorely needed — something to rouse them with an intimation of the great rôle that was theirs should the opportunity come and they use it right. Especially some signal success was needed to awaken them to renewed efforts. Both officers and men felt that they were groping in the dark for the unseen foe. Occasionally they heard him send radio signals, but usually the bored operators failed to get bearings before the signals had ceased. No one had ever seen a submarine successfully tracked down by radio compass and by hydrophone, and therefore the prospect of this feat was not real to them.

The radio compasses on the shore stations, with their long range of operation, were now beginning to get cross bearings on enemy submarines from time to time, and were making an encouraging beginning in tracing their movements about the sea. But as yet little had been done to direct the destroyer squadrons by this method to the fruitful hunting grounds. It was time for a concerted effort to bring about a successful hunt which would serve to demonstrate what could be done with the materials already at hand.

Evans found technical duties to perform at Communication Headquarters on shore, as well as in the main radio room of the mother-ship to which he was attached, and these duties gave him the opportunity to follow closely the reports that were coming in from the radio-compass sta-

tions on the various islands. In this way he knew as much as any one in the force about the movements of enemy submarines. He watched the increasing efficiency with which their movements were revealed, and at the same time he gradually acquired a familiarity with the habits of the undersea pirates and the general plan upon which they operated.

He studied the personnel on the various hunting groups of destroyers, and talked with their skippers whenever the opportunity offered. He was looking for the most promising group with which to give a demonstration that would wake up the men. If a squadron could once pick up the scent by radio-compass triangulation and then get the sub within hydrophone range, there would be a good chance of ending her career; and even if they only gave her a hard run for her life, a report of this would do a deal of good to the rest of the flotilla.

Therefore he searched diligently among the young skippers as they came and went on their arduous patrols; with each he found business to discuss, and thereby sized him up. At last he found the man he wanted, one of the senior skippers in the flotilla, a man named Fraser, with the rank of commander. He was a tall, well-built, fair-haired man, clear-eyed and alert, with a magnetic personality. Wholesome and vigorous, with a boyish enthusiasm and a genuine frankness about him, he at once inspired in Evans a strong liking, and, more than that, a confidence that he was a real man. He saw at once that Fraser was in earnest, and open-mindedly seeking any and every means that human ingenuity could devise to get the enemy. Fraser took Evans for what he was, regardless of rank, and eagerly discussed with him the problem of utilizing all the gear on his ship to the best advantage. Evans did not take long to discern

that, besides the charm which had attracted him, Fraser had a mind of unusual quality, clear and strong, well trained in his profession, but untrammelled by the fetters of tradition; a mind that could grasp quickly, think straight, and see with the vision that comes only with imagination — a quality without which no man can be a truly great naval or military leader. Evans found plenty of lines of approach to Fraser through questions of the fitness of the radio gear for the various tasks required in the team-work of the hunting squadron. Through such channels he led the conversation into a discussion of all the possibilities that might arise in the pursuit and attack of a submarine, a discussion which was mutually profitable. They naturally spoke the same language; far fewer words sufficed to convey ideas to each other than was the case with most of the skippers. Each caught the other's meaning with a minimum of explanation, and each knew that the other had caught his. Chatting together in the radio room they picked up the trail of an imaginary submarine by radio compass and maneuvered to get her within range of the hydrophones and magnetic detectors.

"I wish you'd go out with us on patrol," said Fraser, "and see to it that all this gear is being handled right. You could help us by seeing that the boys understand their duties and are making the most of these things."

"There's nothing I'd like better," said Evans.

"I'll get Larabee to let you come. It won't be hard to arrange."

This was what Evans wanted. He proceeded to interest Fraser in the work that the radio-compass shore stations were doing in reporting the movements of enemy submarines. Fraser had not appreciated the extent to which this had become possible.

"I tell you what we'll do," said the Commander; "we'll choose a time when they've got a hot scent of some subs coming within striking distance, and then we'll go to it."

Soon thereafter Evans and Fraser met more than once at Communication Headquarters and looked over the radio-compass reports together. Before long Fraser was making the same generalizations concerning the habits of the enemy at which Evans had arrived. And as in the ensuing days, they watched the reports, Evans visited the three destroyers in Fraser's squadron and made sure that men and material were up to standard in every detail, from the radio sets to the hydrophones and the internal communications on each ship. He drilled the radio-compass operators in taking bearings on dummy signals, drilling them so hard, with ever shorter and shorter messages, that soon they could give him a fairly good bearing even on the briefest signals.

Before many days of waiting had passed, reports came in from the radio compasses at the Grand Canary, Madeira, and the station at the eastern end of Saint Michael's, showing that two submarines were proceeding on a north-westerly course from Lisbon toward the steamer lanes of the North Atlantic. First, one had been detected communicating with her base, and then the two communicating with each other and increasing the power of their signals as their divergent courses required it. The Flag Office, which had somewhat reluctantly acceded to Commander Fraser's request that he be allowed to hold his squadron in port in order to await such an opportunity, now issued the orders to proceed to the indicated area in search of the enemy, and granted his request that the radio gunner should go with him on his ship.

Evans contrived to visit the weather station before sail-

ing, and received assurance of two days at least without storms or fogs. He also arranged with Communication Headquarters that if the shore stations should report another "fix" on their intended quarry, the news should be transmitted to them without delay. The message was to be repeated three times, and there would be no acknowledgment, for the squadron had better keep quiet on this hunt. At dusk he went aboard the destroyer, and as he reached the deck he heard with a thrill the roar of the great blowers voicing the impatience of the ship to spring to the full speed of her thirty thousand horse-power. His blood stirred as he recalled half-forgotten days when to the tune of the same roar the gaunt destroyer on which he lived — a mere lad then — slipped her mooring at Queenstown and stood out into the wet drizzle of the North Atlantic. "From chief radio electrician to radio gunner," he thought — not much change in status for twenty years.

It was just after dark when the three destroyers slipped their moorings and, headed by Commander Fraser's ship, took the opening in the net at sixteen knots. Completely darkened, they headed south till well out of sight of land, then turned east and rounded the end of Saint Michael's far enough away to be invisible from shore. It was not forgotten in the navy that news had spread mysteriously from Queenstown to Berlin with lightning speed in an earlier generation, and there were those on shore who were not over-friendly at heart with the Americans.

The last reported "fix" of the two submarines had shown them to be proceeding approximately northwest by west at eleven knots, having left Lisbon on the morning of the previous day. As the destroyers cleared Saint Michael's, Fraser laid his course north by east one half east, or, as they say in the navy, seventeen degrees. Up to this

point they had steamed in column, but now they formed a scouting line, Fraser's ship in the center, each wing boat six miles away bearing abeam from the flagship. The accuracy with which these ships could place themselves by dead-reckoning, using engine revolutions for distance and careful steering for direction, was such that they could shift from column to line abreast and hold their relative positions for a considerable time, dark as it was, without any direct means of checking them. But this would not suffice for the task in hand; now they must be prepared for accurate triangulation upon their victim by radio compass with their scouting line as a base; they must at all times be sure of their relative distances and bearings from each other, for on this would depend their locating of the submarine by radio bearings. Attached to staffs at the bow and stern of each ship were two strange lanterns. No visible light came from them, but each emitted horizontally a powerful beam of infra-red rays, invisible to the eye, but capable of detection with a delicate instrument. By means of this instrument observers on the bridge of each destroyer could tell just where the other destroyers were — could register both direction and distance, invisible though they were to the eye even with the most powerful glass. Thus the two wing ships kept themselves in their proper positions as the flagship steamed ahead through the night, and thus the flagship verified the positions which they kept.

All night they steamed at eighteen knots, and though they did not expect to be in the vicinity of the submarines they sought till the following night, still all hands maintained a ceaseless vigilance. The weather was fine, and the three slender ships left scarcely any wake as they slipped quietly through the water.

There is no warrant officers' mess on a destroyer; when

warrant officers are present, they live in the wardroom with all the other officers, from the skipper down. Thus there is an informal atmosphere which is far removed from the traditional etiquette of a battleship. Evans found himself in a party of genial youths which might have been taking a vacation cruise together in a small boat, as far as one could judge from the wardroom life. Fraser put them all at ease, encouraging in every way the informal spirit of good-fellowship, yet never for a moment losing their respect nor failing to inspire them with the sense of his leadership.

They were a heterogeneous mixture, the officers of this ship, eight in all; three besides the skipper were graduates of the Naval Academy; one was a temporary ensign who had worked up from the ranks through the grades of chief petty officer and warrant officer; three were college boys of yachting experience who had joined the navy for the war. But months together at sea under the magnetic personality of their commander had welded them into the most harmonious and congenial crew of shipmates. One of the college boys, Jackson by name, was a very good singer, having been prominent in his college glee club. Besides this he was uncommonly handy with the mandolin, a gift which was much appreciated on board the destroyer. He had brought with him his mandolin and some old college song-books, both of which were in demand. The skipper was fond of good singing and had a very fair voice himself. So when the day's duties were done, it was their wont, as often as might be, when the supper dishes had been cleared away, to make the wardroom ring with many a rousing chorus. All of the gang would be there but the lone officer who "had the deck." He, standing on the bridge, alert and watchful, directed the man at the wheel and the quarter-

masters as they moved swiftly about, performing the duties of the ship's nerve center. He held the lives of all on board in his hands while the others made merry below. And whenever it was not Jackson's turn as officer of the deck during the eight-to-twelve watch, he would "break out" his mandolin, and harmony would reign in the cheery little wardroom.

On this occasion the day following their departure proved uneventful. Steadily they held their course at eighteen knots. The visibility was fair and there was no difficulty in maintaining the scouting line according to plan. Fraser conferred with his executive officer and Evans at some length over the details of their intended procedure. All hands at the radio compass, the hydrophones, and magnetic detectors were coached as for a great athletic contest till each man looked forward to the coming night as the chance of his life. Early in the morning a message had been received from Punta Delgada reporting the submarines still heading northwest by west at eleven knots. The destroyers themselves had not heard them, for their range was not equal to those of the shore stations with their marvelous amplifiers, too sensitive and too cumbersome to be successfully installed on vibrating or crowded ships. All day long no signals were heard, and none were expected till midnight, for the subs would not send signals needlessly, and when they did they would use so little power that the hunting squadron could hardly expect to hear them more than fifty miles; at the present speed they should be within fifty miles of the supposed position of the enemy about the middle of the night.

Darkness came, and the infra-red lanterns were again turned on. All was in readiness, the radio operators on watch listening like wild animals in the night. Fortunately

Jackson did not have the eight-to-twelve watch that night; so when supper was finished, the skipper said to him:

"Jackson, break out your mandolin and let's have some old-time songs; it'll do us a lot of good."

Evans had slipped off to look over the radio gear once more and see that all was in perfect order. This done, he rejoined the crowd in the wardroom just in time to join in the chorus of "Lucy Lee," a song which was having a great run of popularity at the time. Jackson turned over the leaves of one of his song-books and picked out one favorite after another according to the mood of the moment. Some he sang as solos; some were familiar airs that all joined in singing. Fraser, thoroughly enjoying himself, did his share of the singing, looking over the book, and now and then suggesting a song that caught his eye. In a lull between songs, Jackson rambled on with his mandolin through a kaleidoscopic series of melodies till through some strange caprice he stumbled on a Christmas carol which most of them knew. They sang it, and Fraser then fell to recalling the winter evenings in his boyhood when he with other children of the village where he lived had sung this and other carols with the new-fallen snow on the spruce trees reflecting the lamplight from the window with a golden glow. Evans picked up the old Princeton song-book off the wardroom table and began turning over the leaves. Suddenly his face lighted as he turned to "Stand to Your Glasses Steady."

"That's the most stirring song ever written by man," he said. "That was written by a British army officer facing death in the great cholera plague in India."

Jackson looked at the song and started playing the air from the notes.

"Oh, yes!" he said presently. "I remember that. My

older brother used to sing it when I was a little kid. He had a crowd of them home from college with him, and they all used to get going on that song. My God! how they raised the roof with it! I'll never forget it."

Evans and Jackson sang the song together, Fraser looking over the page and joining in after the first verse. There was a fire in Evans's voice which it took this song to bring out, and every one sat up and took notice, and before the song was done each felt it.

Fraser spoke with warmth, "That is a wonderful song. Let's try it again; maybe every one can join in this time."

They sang, and the song rang out with all the fire that's in it — the fire that makes it immortal. They had just begun the third verse,

"Who dreads to the dust returning?
Who shrinks from the sable shore?"

when a sharp call through the voice-tube from the bridge broke in:

"Radio room reports a high-pitched spark on five hundred metres."

Almost before the others had taken it in, Evans shot out of the door, saying, "The hunt's on."

Running aft along the matted deck, he climbed the ladder leading to the radio-compass shack, and, silently opening the door, seated himself beside the operator on watch who was listening intently as he rotated the coil back and forth, his eyes glued on the dial. Evans slipped the spare head-phones over his ears and plugged them into a socket which enabled him to listen in with the operator. Not a sound could he hear. After listening a moment, he said, "D'you get a bearing?"

"Very rough," answered the operator. "He only sent

for about three seconds after they opened the main antenna. I reported it, though."

"What was it?"

"Fifteen degrees," answered the man.

Evans made a mental calculation. "We're headed seventeen; that makes it thirty-two, true," he said to himself.

They sat a moment in silence, then suddenly there came through the receivers a rapid series of dots and dashes in a peculiar high-pitched note. Both men grew tense as if struck by an electric shock. Almost instantly a small light flashed beside the operator, showing that the main radio room had heard and recognized the unmistakable note of an enemy submarine, and had opened the main antenna to enable the radio compass to function. With a rapid spin the operator whirled the coil through a large angle, stopped it and spun it back a little more slowly. The message stopped, but it was enough.

"How's that?" said the operator, turning the coil part-way back and stopping it.

"Right, as near as I can judge," said Evans. "Let 'em have it."

The operator called through the voice-tube:

"Bridge — thirteen."

Evans listened a minute more, then hearing nothing, took off the head-phones and, saying, "Do your damnedest, and we'll have this goose cooked by morning," he slipped out of the shack and ran up to the main radio room to see how things were working there.

Ever since he left the wardroom the skipper had been conversing with the wing boats by radio telephone. Both wing boats had reported their bearings. Evans satisfied himself that enough power was being used in the trans-

mitter to reach the wing boats, but no further. Then he went up on the bridge. Commander Fraser was at the moment talking to the other destroyers.

"Now's our chance," he said. "Keep the boys on the job, and on your life don't miss any tricks."

Fraser put up the phone. Catching sight of Evans, he said:

"Exec.'s plotting the fix in the chart room; let's see how he's coming out."

They went to the small chart room on the after part of the bridge, and looked over the executive officer's shoulder. He was just finishing his plot of the second set of triple bearings from a line on the chart representing the twelve-mile scouting line of the three ships. Where the lines met they crossed in a pair of elongated triangles which overlapped in a small area.

"Those look like good fixes," said Fraser. "Where would you put him, Evans, on the strength of them?"

Evans drew a pencil line around the two triangles, enclosing an area about seven miles long and two miles wide. "It's safe to say he's somewhere in that area. The second fix was the best; I'd go more by that. If we put him there, we shan't be far off," and he marked with his pencil a spot near the center of the triangle made by the second set of bearings. This spot was thirty-eight nautical miles from the present position of the flagship. Fraser said, "They're undoubtedly still steaming northwest at about eleven knots; but they'll change when they hear us coming." Then he made a hurried calculation, stepped to the radio phone, and called to the other destroyers:

"Course, twenty-three degrees, true; speed of port wing boat, thirty-six knots; starboard boat, thirty-two knots till line is true on the new course, then squadron speed thirty-

six knots; keep six miles distant for the present; speed up now."

He put up the phone, said to the officer of the deck, "Course, twenty-three degrees; speed, thirty-four knots." Word was passed to the engine room, and almost at the same moment the three destroyers swung six degrees to starboard and leapt forward like greyhounds unleashed.

There was a light head wind which at eighteen knots had scarcely been noticed, but now, as they dashed headlong into the seas at double the speed, masses of fine spray rose from the bow and swept madly past, white and ghostly in the darkness, mingling again with the tumultuous white wake receding rapidly astern.

But there was little thought of spray or foam on the bridge. Captain and "exec." alert and tense, conversed in brief sentences, while the officer of the deck with brisk orders directed the business of the bridge. Quartermasters, on the jump, dispatched their duties, noting and reporting readings of the wing boats' distance and bearing. The helmsman, ignoring all else, kept the racing ship true on her course. Elsewhere gun crews and depth charge crews were ready for instant action.

Fraser turned to Evans.

"Has he heard our radio phones yet?"

"Not with the power we're using," said Evans. "He'll get us by hydrophone first. At thirty-six knots we'll make a noise he can hear a good way off."

Ten minutes passed. Then the man at the radio-compass voice-tube reported, "Bearing three degrees," and a moment later the wing boats each reported a bearing taken on the same signal of the enemy. In a second the executive officer was plotting the bearings from the new base line.

"Corking fix! They damn near meet in a point," he said to the skipper and Evans who were close behind him.

"The blighter hasn't changed course yet," said Fraser. "I don't believe he's heard us."

The new fix showed that probably the submarine was still traveling northwest at about the same speed as before. But now her distance was barely thirty miles.

After this no more radio signals were heard. Had she heard them racing toward her yet? If so, she would soon be submerged, and they must find her by hydrophone. By this time the three ships had squared their scouting line and were tearing through the water at thirty-six knots.

For fifteen minutes they rushed on through the darkness, holding their line in perfect order, but hearing no sound and seeing no sign. The suspense grew. The submarine could not now be more than twenty-four miles away. Fraser again called the other ships by radio phone, and ordered them to close in till within two miles of him.

"How far off could he hear us coming at this speed?" he asked of Evans.

"If he stopped to listen, he'd hear us all of thirty miles, if he has the gear I think he has. But I trust he has had no intimation of our coming, and hasn't stopped to listen. Running at eleven knots he might not hear us till we're within fifteen miles or less."

"When he does he'll submerge and do his damndest to fool us," said Fraser.

"He'll know we're closing in to cover him with our hydrophones," said Evans, "and assuming that, his best chance to get out of range is either to hold the course he's been on, nearly at right angles to ours, or to double back about at right angles the other way."

"I wonder which he'll do."

"I bet he'll go back," said Evans.

"He's about as likely to think we'll expect him to, and keep right on."

"They don't think much of our intelligence," said Evans. "Of course it's a gamble; but I bet he thinks we're too stupid to think of his doubling back; he'll bet on our going for the place his course has been taking him."

"Well," said Fraser, "suppose he hears us when we're fifteen miles off, and then submerges and changes course. His best speed submerged is nine knots. By the times we get there he may be anywhere within a radius of about four miles of that point. The farthest we can hope to hear with our hydrophones, while we're going faster than he, is a mile. That means we can cover at best a strip six miles wide. We've got to leave two miles of the circle uncovered on the first shot. If we miss, we can double back. If he goes slow enough, we're apt to miss him altogether. I guess it's our wits against his, with a betting element thrown in. Anyhow, I'm not betting on him to-night."

Twenty-five minutes of converging courses brought the wing ships within two miles of the flagship, and dimly their dark forms and white streaming wakes could be seen through the darkness on either side. Now the assumed spot where the submarine, hearing her pursuers, had probably submerged, lay seven miles dead ahead; — twelve minutes more at their racehorse speed.

Fraser spoke. "Evans, I'll chance it on your guess, and cover the eastern half of the circle, leaving the western two miles to search later if we miss."

A few brief words were flashed out by radio phone, and the next minute the squadron had changed course eight degrees to the eastward, and all three charged on at top speed.

Presently the executive officer said, "Isn't it about time to slow down and give the listeners a chance, Cap'n? They can't hear anything while we go at this speed."

"The trouble is, he'll hear us and slow down, too," said Fraser. "He'll slow down till we can't hear him unless we're right on top of him. There's little chance he'll be near enough to hear yet. I'd rather go full speed till we're almost on the line I think he's on, and then stop quick and try to spot him before he has time to slow down. Tell the engine room to be ready to stop all auxiliaries when I give the word, and give the listeners warning."

Calling the other ships by phone, he gave them similar instructions. Nine minutes passed in silence save for the roar of the blowers and the swish of the waves and the ghostly sheets of spray swirling past over the bridge and lifeboats. The executive officer was beginning to fidget. Commander Fraser stood with his eye on his watch.

"Stop the auxiliaries. Give the word to the listeners," he called quickly. "Ready? Stop the engines."

A signal was flashed to the other ships. The great torrents of steam pouring into the turbines of the three ships stopped almost as if the valves controlling them were geared together. As the ships lost headway, the suspense became almost unbearable. A minute elapsed, with no word from the listeners, but to every man on the bridge it seemed an hour. Then a voice from the hydrophone station down in the hull called, "Motors heard slowing down, too faint to get bearing; slowed and became inaudible about five seconds after engines stopped."

"My God! I wish the wing boats would report," said the skipper.

The words were hardly spoken when the radio phone from the starboard ship reported, "Motors heard slowing

down as we stopped, roughly bearing fifty-five degrees, true."

Fraser fairly jumped for joy. Eagerly he called the port ship: "Have you heard anything?"

"Nothing heard," was the answer.

"Starboard ship reports motors bearing fifty-five, true; motors heard here, no bearing," he replied. "Submarine probably three to six miles east of us. Your course is eighty degrees, true, speed, thirty-five; start now."

"Aye, aye," came back from the port ship.

To the starboard ship he called, "Course, eighty, true, speed, fifteen; start now."

Then to the officer of the deck, "Course, eighty, true, speed, twenty-five."

In a few seconds the pack was dashing forward again in a maneuver calculated to bring them in nine minutes into line on their new course, within a mile or two of their prey — perhaps less.

Fraser reviewed the evidence:

"Bearing fifty-five from starboard end; barely heard here; not heard port. It's a good scent, if it isn't a fix."

"We haven't got him yet," remarked Evans uneasily. "He may stop altogether and balance with his tanks. Then we'll have to find him with the magnetic detectors, and that way we can barely cover a thousand yards, the three of us. It won't be any cinch."

But the frightened submarine underestimated the hydrophones of her pursuers and preferred trying to steal away at the almost silent speed of three knots. In the last half of the ninth minute, as the ships were coming into perfect line, Fraser again called a general halt; and as the three ships made their sudden stop which enabled the sensitive hydrophones to penetrate the silent deep about them, clearly the

listeners down in the three hulls heard at the same moment the faint hum of motors, again dying quickly away as the fact that the pursuers had stopped again to listen was reported to the submarine captain and the motors were hastily shut down. But this time each ship had heard, and each had read the bearing.

First the report came up the voice-tube from the flagship's own hydrophones, "Relative bearing three forty-three."

"What does that make it?" said Fraser.

"Sixty-three, true," answered Evans.

"That's right," said Fraser, and, turning to the executive officer, "Plot it."

Next in quick succession came the reports from the wing ships: "A hundred and sixteen, true," from port; "twenty-five, true," from starboard.

"Plot 'em lively," said the skipper.

The "exec." lost no time, and as the third line he ruled crossed the other two almost at their point of intersection, Fraser gave a shout.

"A fix for fair!" he cried, and, seizing the radio phone, called simultaneously to both wing ships, "Do you still hear submarine?"

Only silence was reported from all three ships; the sub was clearly lying still to escape detection, or stealing along with her motors barely turning over.

Receiving this report, he called back, "Submarine moving very slowly or not at all; fixed at a point bearing sixty-three degrees, true from flagship; distant twenty-five hundred yards; close in at thirty-five knots to two hundred yards for attack." This was followed by instructions as to courses needed to execute this delicate maneuver, bringing each ship on his flank at the right moment to cover with a

destructive pattern of depth charges the area where the submarine must be. Again the three ships leapt to high speed, the wing ships converging sharply toward the flagship, while she forged slightly ahead of them.

"He knows we've got his trail," said Evans. "He'll probably strike out to one side at full speed. If he does, he can get clear of the destructive area of our pattern before we can get there to make it."

Fraser, who, getting so clear a fix on a submarine so close at hand, had felt ready to attack without further reconnoitering, especially as the sub had apparently been motionless when he started his dash for the attack, now did some quick thinking, making mental calculations half aloud:

"Twenty-five hundred yards, two minutes and a half; subtract fifteen seconds for hearing us start and giving orders, fifteen more for getting up his speed; two minutes — nine knots — six hundred yards. That's right; he'll just about clear us if he uses full speed."

He looked at his watch, then gave orders preparatory to another halt, then looked at his watch again. After a minute and a half on converging lines he called a halt. Once more the listeners heard the submarine motors stopping more quickly than before, but now they were near enough to get a fix in spite of the abruptness with which the sound ceased.

The fix showed the submarine now only a thousand yards from both the flagship and the port wing boat. Fraser well knew that as long as the destroyer lay still they could detect the submarine at this range if she tried to move at a speed of more than one knot. Therefore, he took his time planning how to place his depth charge pattern, for, though the stern of each ship was well stocked with these destruc-

tive cans, the total area which they could cover with the certainty of a kill was, after all, not large. The maneuver planned to a nicety, he gave the order for the final charge.

"We can cover him this time," he said.

Jumping to thirty knots, the port wing boat and the flagship rushed in on sharply converging courses till the men on the bridge of each ship watched with their hearts in their mouths the black hulk of the other looming up as if nothing could avert collision. But when they were less than five hundred yards apart, Fraser calmly said, "Right rudder," and flashed a signal to the other ship, at which both destroyers swerved upon parallel courses just before they reached the spot designated by the last fix.

At that moment Fraser gave the signal to begin the barrage of depth charges. From rack and Y-gun the great cans splashed into the water, three every six seconds from each ship, and then shock after shock seemed to jar the whole ocean. Astern through the flying sheets of spray from the bow could be dimly seen a solid wall of white fountains towering high against the sky. Meanwhile the starboard ship, left behind by the submarine's dodging to port, raced after the other two with all the speed she had. Overtaking them she laid her pattern down, piecing it on to those already begun by the other two, so that not a square yard of the designated area should escape the force of the high explosive. For half a minute the first two ships let loose this frightful din, twenty charges from each ship; then, as the starboard ship finished her pattern, it ended as suddenly as it had begun, and at a single word from Fraser all three stopped short to listen. Had they got her?

It was at this point that the magnetic detector showed what it could do. This device was able to show the presence of a mass of steel the size of a submarine if it came within a

hundred and fifty yards. One man on each ship had been assigned to keep his eye on this and nothing else. As soon as the din had ceased, reports came to the flagship's bridge that toward the end of the area bombed a small deflection had been seen on the flagship's detector, and one twice as large on that of the port ship.

"She couldn't have been beyond the port boat, could she?" asked Fraser.

"No; we shouldn't have got any deflection at all in that case," answered Evans.

"Can you trust it not to make deflections out of nothing, or due to the depth charges?"

"No gear is absolutely infallible, but I think you can trust this, especially as the starboard boat got no deflection, and the sub hardly could have got far beyond the port wing boat, in the time she had."

"That's reasonable," said Fraser. "Anyhow, we'd better wait here and listen a bit."

Fifteen minutes passed, and not a sound was heard. Was the submarine sunk? Was she so crippled that she could not move, or was she "playing 'possum"; playing dead in hopes they'd leave her? Submarines have survived a barrage as dense as this one, damaged, but still able to lurk beneath the sea.

At length Fraser said, "I think we'd better explore."

The three ships turned cautiously round and headed back for the spot indicated by the magnetic detectors, steaming at only six knots, so that no sound should be missed, the flagship slightly in the lead. They had gone perhaps two hundred yards into the bombed area when the man on the flagship's detector reported a deflection.

"Is it getting bigger?" asked the skipper.

"Yes," came through the voice-tube.

"Let us know when it's maximum," he called back.

Just then from the starboard boat came the report, "Very slight deflection."

A few seconds later from the voice-tube came, "No further increase."

At a word from the skipper a float with a light was dropped over the stern to mark the spot.

Dropping depth charges at six knots is unhealthy for the boat that does it, as some learned to their cost in 1918. Therefore no "ash cans" were dropped during this exploratory maneuver. As they passed on away from the lighted float, the deflection of the magnetic detector grew smaller and disappeared. The detectors of the three ships indicated that the sub had been almost under the flagship, but a little way to starboard. Her position was well marked by the light. Proceeding far enough to get up a safe speed for bombing, the three ships turned and formed their line with greatest care, this time closer together. Then they steamed back at a good speed over the marked spot. Just before they reached it, the signal was given, and a small but deadly pattern of depth charges began to fall. Through the skillful generalship of Commander Fraser the circle of certain death surrounding each depth charge was made to overlap those of the adjacent charges. Two men standing at the stern of the flagship, straining their eyes back into the darkness, reported seeing black things rise into the air in the midst of the great white fountain of shattered water following one of the explosions. But this was not enough for Fraser; — imagination may play strange tricks on a night like this.

As soon as the last bomb had exploded, the ships stopped short once more, and listened. Not a sound was heard beneath the waves. Again they turned and steamed slowly

back to the spot where the focus of the attack had been and dropped overboard another lighted float to replace the first which, needless to say, had been demolished by the barrage. This time the magnetic detectors showed not the slightest deflection. Slowly they steamed back and forth twice over the marked spot, listening as well as watching the magnetic detector, but not a sign or sound was recorded. Then they steamed at fifteen knots on a "retiring search curve" like a watch-spring around the lighted float, listening intently, till they had covered a circle with a radius of a mile and a half, but no trace was found, magnetic or audible, of the submarine. The inference seemed clear, for had she been slipping away from them they would have heard her, or if too slow for that the magnetic device would have found her somewhere in that area. Could there have been some serious lapse in the vigilance of the trained listeners and observers, or some error in their calculations, or had the submarine, indeed, been sent to the bottom of the sea?

It was nearly two o'clock, and strained nerves were feeling the effect of their prolonged nocturnal adventure. And now a tawny moon rose over the eastern horizon, and under it a golden trail marked the crests of the waves.

"That may help us," said Fraser.

The light on the float glimmered faintly on the water near the focus of their last barrage. Toward it the three ships steamed, swerving as they approached it so that the supposed point at which the submarine should have sunk would lie in the wake of the moon. As the light on the float was lost among the flashing crests of the waves, the squadron swung into line abreast, and laid its course straight into the shimmering path of gold on the water.

"There!" said Evans eagerly, pointing toward the moon's wake. "There's your oil slick, isn't it, Captain?"



“THERE’S YOUR OIL-SLICK, ISN’T IT, CAPTAIN?”

"Yes — yes, that's it for sure," said Fraser. "We'll examine it a bit."

As they approached, the smooth patch on the water, spreading across the wake of the moon, was unmistakable. At first a slender line, it widened to a band, as they came nearer, till it clearly covered a large area, spreading out into the darkness on both sides of the moon's wake.

Slowing down as they approached the edge of the oil slick, they prepared to skim the surface of the water for a sample of the oil, that it might be identified by the chemist at headquarters.

Suddenly Fraser exclaimed, "Hullo! There's something else. Left rudder."

The shining surface of the oil slick was broken by a small black speck. He was heading the ship straight for it. Other dark fragmentary objects were discerned. Fraser signaled to stop the engines. In another moment he was down on deck directing the seamen as they fished a few floating objects out of the water. Evans had followed him. When the first of these was brought aboard, Fraser seized it and carried it quickly into the light of the wardroom. It was a splintered piece of wood. Fraser examined it carefully, then reached for another which a boatswain's mate brought him from the rail.

"That settles it," he said. "We got her."

To his professional eye there was no doubt that this wood had come from the inside of an enemy submarine. Other fragments were brought in which confirmed his conviction; mute testimony to the tragedy just ended in the depths of the sea. Before long, enough fragments had been gathered to provide souvenirs of the chase to every man on board.

"It has been a wonderful hunt," said Evans with warmth,

"and the team-work of your squadron is the best thing I ever saw. The other ships will like to hear the result."

"Yes, I'll tell them," said Fraser, and went off to call them by radio phone.

Evans left the wardroom and hastened aft to the radio-compass shack. The operator who took the bearings had been relieved at midnight by the other operator assigned to this duty, just before the final barrage was dropped. But with things like this going on he did not, as usual, turn in and go to sleep. He stayed beside his mate in the shack where Evans now found him still listening with the extra phones. It was not their part to question, but only eternally to listen. Through the din of the bombing and through the long hours afterwards, they had listened intently and patiently.

Evans came into the shack like a gust of wind.

"We got the sub," he said to the tired operators, "and we have your good work to thank for it, not forgetting the hydrophone listeners. You gave us good fixes, you and the boys on the other ships, and without 'em we couldn't have got her; neither could we without the hydrophone fixes later on; as for the skipper, you're lucky to be on his ship, he knows how to use your fixes when you give 'em to him."

"I reckon I didn't do much," said the second operator.

"There'll be another hunt, and maybe you'll get your chance then."

He then outlined to them the story of the hunt and attack, showing the significance of what they had done. Then with a final word of congratulation he left them and went forward. Whatever else those men forgot about the war in after years, they never forgot that.

The men on all the ships were tired; the depth charges were so nearly expended that had another submarine been

found they couldn't have attacked her with much hope of success. Therefore they laid their course for Punta Delgada and in the early dawn, twenty-six hours later, slipped into the harbor and tied up to their moorings.

Commander Fraser submitted to the Force Commander a report of the hunt, which was a model of instructive exposition. Copies of it were distributed among all the destroyer captains for their enlightenment and for the instruction of the officers under them. It made a great stir, and was the chief topic of wardroom talk for the best part of a week. Those skippers who studied it intelligently, grasped the lesson taught, and then prepared their own ships to follow the lead, soon began to harass the enemy submarines. Two or three squadrons, conscientiously practicing the method indicated, actually had encounters in which they sank their victims. Those skippers who lacked the imagination and faith to see and do the thing right continued to grope listlessly in the dark, and laid the success of the others to luck.

One result of all this was that the enemy began to realize they were losing submarines at an increasing rate; and consequently they studied carefully the reports of those that came back damaged. This study led the submarine commanders to operate with greater caution, to zigzag, and especially to refrain as far as possible from using their radio. And soon the upshot of this was that, while the Allied shipping had gained materially in the restrictions placed on their ability to do damage, the enemy submarines became almost as hard to find as ever.

CHAPTER VII

THE FLEET ARRIVES

IN August the preparation of Punta Delgada as a base for the entire fleet was completed, and the fleet arrived. In supreme command was Admiral Johnson, a distinguished figure, a man of commanding personality, well trained in his profession, and conspicuous for his faculty of maintaining the morale of the fleet at its best.

The change at Punta Delgada was impressive. Hitherto the informality of the destroyer had characterized the life there; now all the pomp and ceremony of the battleship pervaded the place. Where once the most typical sight had been officers and men, in old and paint-smooched uniforms or in dungarees, working among the torpedo tubes and engine hatches on the cramped deck of a lean destroyer, now the eye turned to the mighty dreadnaught with her vast expanse of quarter-deck, immaculately clean, on which paced to and fro officers in faultless uniform. The sea was dotted with these great ships and with scouts and armored cruisers and a host of auxiliary craft. Liberty parties came and went, and the picturesque old town swarmed with American blue-jackets, interspersed with the sailors of the British and French navies.

It is the pride of radio officers and radio chiefs in the fleet to be able to deal with their own problems when away from the home Navy Yard — to be independent of outside help. So it was with the fleet at Punta Delgada. Problems they had, but it would not occur to the radio personnel of a battleship to look for help in their solution to the mother-

ship of a destroyer flotilla. Yet it wasn't long before the radio chiefs on the battleships discovered that the radio test shop where Evans worked was a place worth visiting. Interesting things were to be seen there, and ideas and hints could be informally picked up which somehow helped them make their apparatus work when they got back to their own ships. Thus the little laboratory came more and more to be sought as an oracle. As a consequence of this, Evans soon came to be welcome in the radio rooms of the various battleships and cruisers where problems existed.

Lieutenant Larabee, under whom Evans was technically supposed to perform his duties, naturally felt that his handy gunner belonged to the flotilla, and he was prone to demur a bit at his digressions into the battle fleet. But he had come to feel that Evans's activities were somewhat difficult to control, and that after all it was just as well not to try to control them too rigidly. Besides, Larabee had sense enough to see that, if Evans's services could be really useful to the fleet, the fleet had better have them.

Evans found the radio equipment in too many of the ships in a disappointing condition, the more modern apparatus was badly installed and very poorly understood by the personnel. The new British vacuum-tube transmitter on very few ships was giving the efficient service and satisfaction of which it was capable. He soon discovered to his dismay that just where perfection of apparatus was of most vital importance to the entire fleet — where it ought to count for as much as in all the other ships put together — in Admiral Johnson's flagship — there all the best efforts of the Bureau of Engineering to make the nerve center of the fleet perfect had been slighted. His first visit to the flagship made his heart sink. Because of her supreme importance in directing the whole fleet, her radio room had been enlarged

and equipped with apparatus more highly developed than had ever been seen aboard ship. Special methods had been devised to expedite the handling of the great and complex volume of dispatches to all branches of the fleet which in a great naval action must go on without interference or confusion. The initial installation had been made, but the space needed for using it properly had been encroached upon for miscellaneous storage purposes, and the most valuable features of the installation had been neglected and abused till it was woefully crippled. The plan of fleet control so carefully worked out in the Bureau was frustrated at its central point, in the flagship.

Evans began looking for the cause of the trouble. The radio chief was listless and discontented. But it was not his fault. The fleet radio officer seemed discouraged and disgruntled. At first he was rather uncommunicative as to the general plan of coördinating the fleet's activities, but before long the sympathetic interest which Evans showed in the problem of making the most of the situation, drew him out and revealed the fact that the trouble lay in the Admiral's chief of staff.

This officer, Captain Brigham, was one of the senior four-strippers in the navy. A man of impressive bearing and iron will, he was a conspicuous exponent of the conservative point of view in all naval matters. He was insistent on decorum and etiquette to the last detail, and he guarded his authority and prestige with a jealous diligence. He was one of those officers who insist on keeping their fingers on every activity that comes under their jurisdiction, if only to throttle it. All the officers on his staff excelled in "officer-like bearing." Nowhere in the fleet were salutes executed in more perfect form. Behind this cloak of faultless formality there was nothing which made for efficiency in the coördi-

nation of the fleet. Captain Brigham had Commander White, the fleet radio officer, completely under his thumb. White had ideas as to the proper organization of communications, but they were snubbed before they even found expression. Captain Brigham had himself been a radio officer for two or three months just after the close of the war with Germany, and he flattered himself that his knowledge of radio was all that could be desired.

The new methods which had been developed by the Bureau of Engineering, to meet the vast demands of the modern fleet with the best that science could offer, differed so much from those which he recalled as standard in the days of his youth, that they were not to his liking. He had abused his authority by having the more modern parts of the apparatus dismantled, and the specially trained operators who understood their use sent away from the ship. The remaining radio force was quite inadequate for the proper handling of the flagship's communications in the event of battle.

These facts were not posted in so many words on any bulletin board, but Evans read them almost as clearly in many signs and symptoms and in the stray remarks of those with whom he talked. With the fleet radio officer he talked quite frankly, discussing the appalling prospect of a great naval action in which the vast fleet of the enemy would operate with perfect coördination between its battle-cruisers, scouts, and destroyers, directed by its flagship, as much a unit as a battleship operated from the bridge, while the Allied fleet, its directing nerve center semi-paralyzed, would be doomed to confusion, and almost certain disaster.

"Do you realize what it means?" he said. "It would be like a man, with half his brain gone to pot, competing at fencing or wrestling with a champion in perfect trim."

Commander White shrugged his shoulders. "Between you and me," he said, "the radio on this ship isn't what it ought to be; but what can you do about it?"

Evans was on his mettle.

"I'll talk with Captain Brigham, and if I don't make him understand the need of that apparatus, it won't be because I haven't tried."

"You've got your nerve with you," said White. "Take my advice and keep away from him, if you value your hide."

"There are more important things in the service than my hide," said Evans. "I was sent here by the Bureau of Engineering to see that the newer and less familiar parts of the radio equipment in the fleet are in proper working order and are understood by the personnel. If I fail to point out to those concerned what I find amiss, I shall not be doing my job."

"That's a fine spirit, but if you get away with it you'll be a wonder," said White. "I'm afraid, though, you'll be out of luck."

It was not long before Evans found the chance he wanted, when the chief of staff came into the radio room for an inspection. Evans approached and, ignoring his terrible frown, with a calmness of voice which Captain Brigham had never heard in a subordinate since attaining his present rank, explained his mission, and said in conclusion — "I'm afraid the apparatus in its present condition won't give you the service it is meant to."

The tirade from Captain Brigham which this remark called forth would have done credit to a ward politician on the stump. The floodgates of his wrath were opened. The apparatus was as he wanted it and was not to be changed; he was sick and tired of the Bureau of Engineering with its

meddlesome nonsense. Evans listened patiently till he had finished, then put to him some searching and practical questions about the proposed handling of communications. He sketched certain tactical situations which might well occur and asked how the complex task of communicating simultaneously with all parts of the fleet would be handled without the apparatus designed for this purpose. This display in a warrant officer of that function which Captain Brigham had never exercised — imagination in picturing the tactical situations he might have to meet and preparing his mind for them — touched him on a sensitive spot; his wrath knew no bounds. Yet his pride forbade his dismissing the offender at once from his presence, and compelled him instead to talk more volubly than ever, completely evading the issue, and taking refuge in a magnificent invective against modern methods.

“You radio fans and cranks are cluttering up the ships with new-fangled gadgets and good-for-nothing specialists to play with them; soon there won’t be room for the deck force. The ships are on their way to becoming scientific toy shops, and it’s got to be stopped; the ships are meant for fighting. In the days when all the signaling was done from the bridge we had the quartermasters under our eyes where we could watch ’em and keep them up to the mark. Now your big radio force of specialized men can hide behind all this mess of stuff down here, and lounge around doing nothing, and if you try to keep them on the job there’s always some alibi about something no one else knows how to do. In the old days, before we had any radio or listening gear or other playthings, every man on the ship had to be a sailor and a fighting man, and every one of them was worth ten of your damned specialists.”

“I don’t just see, though, how this apparatus is going to

cope with the fleet requirements in action," said Evans quietly when Brigham had finished.

"It will cope with my requirements," said Captain Brigham savagely, "and you'll cope with my requirements if you leave it alone." And with that he left the radio room in high dudgeon.

Commander White had entered during the conversation and heard most of the Captain's tirade.

"Why doesn't he chuck all the radio gear overboard, while he is about it?" said Evans, half to himself and half to Commander White. "He might rig the ship with sails and smoothbore guns, and then engage the enemy at close range with the valor of our fathers. That would breed fine sailors while they lasted."

"Well," said White, "I should say you'd done your duty by the Bureau; and you drew a good salvo doing it. I didn't expect you'd make much progress with the old man."

When next Captain Brigham saw Commander White, they were alone together.

"It wouldn't do to speak of it to that gunner," said the chief of staff, "but I may as well tell you that before I left Washington I had a talk with Commander Rich who handles the radio business in the Bureau of Engineering. He's a man of sound judgment and good old-fashioned horse sense, who understands the point of view of a well-balanced, all-round naval officer, and he doesn't at all believe in having the fighting efficiency of the ships sacrificed to the caprice of scientific specialists. He told me a great deal of the radio junk furnished this ship was authorized against his better judgment, and he believed I'd do well to let the equipment be reduced in practice to the simple, standard gear we are all used to."

For some time White kept this information to himself.

Evans returned to the mother-ship of the destroyer flotilla, and, slipping on dungarees, plunged into a bit of experimental engineering on which he had recently embarked. He worked at it the rest of the day and late into the night, all alone in the radio test shop.

"If only we had Fraser for chief of staff," he said to himself, "we'd have a fleet that could stand up to the enemy with little fear of the outcome; but with this dummy — God help us! The old Admiral's all right, but he's got to have a good chief of staff to swing this fleet."

With feverish energy he wielded pliers and solder-iron till after midnight. Then he put down his things and said, "Well, I've got to sleep on this thing if I can," and turned in.

His sleep was restless and full of stress and worry. He dreamt that he saw a miniature admiral in a cocked hat, standing on the deck of a frigate of the olden days, brandishing his sword. The ship was no bigger than a toy, but the little admiral, puffing with pride, strutted up and down. He looked like Captain Brigham. As the dream progressed, the ship grew smaller and smaller, and the admiral shrank proportionately; but the more he shrank, the more pompous became the bravado with which he brandished his sword. A giant dreadnaught came over the horizon and bore down on the little admiral, her great turret guns trained on him. Nearer she came, her guns growing to monstrous size, till the admiral seemed but a speck in front of the yawning muzzle of a gigantic gun. A projectile, bigger than any the world has ever seen, slid out of the great muzzle, and knocked off the admiral's head which fell into the sea with the splash of a tiny pebble.

Evans awoke with an oath, turned over and slept again. When next he dreamed he found himself sailing in his own

little ketch, the *Petrel*, gliding through tranquil waters by an enchanted shore where great trees hung out far over the water, casting a deep, cool shadow beneath them — trees now resembling the great tree-ferns and other tropical forms of the Borge garden, now the familiar oaks and pines of the New England shore.

In the morning he returned to his engineering task in the radio test shop. The electricians at work there noticed that he was not himself this morning. Most of the time he was silent and abstracted, with a far-off look in his face, or frowning gloomily. Now and then he would show exasperation, wielding his tools as if bent on annihilating the apparatus with which he worked. Now and then he would come out of his trance, crack a joke, and restore the usual good-humor of the test shop.

By the middle of the afternoon he finished his task, put down his tools, and went ashore. With the usual handful of breadcrumbs he sought the Borge garden, wandering through the tree-fern grottoes, and came at last to the ancient watch-tower under the old cedar tree. Here he sat down and gave himself over to luring his little friends, the birds, down from the trees with a tempting array of crumbs. Soon he was surrounded with his feathered coterie, presenting a scene of busy festivity. Then he gazed off over the blue expanse of the sea, dotted with the great ships of the Allied fleet riding easily at their moorings, a panorama of strength and majesty which could scarcely fail to thrill the beholder. But to-day the thrill for Evans was swamped by other emotions.

"Scrap iron and paint, with that poison adrift in the fleet!" he muttered to himself.

He threw some more crumbs on the ground. "What would you do with him, little bird?" he said as one of them

hopped up close to his hand. "Throw him overboard? Throw him overboard damn quick, if you've got the sense I give you credit for."

He sat silent a few minutes more, deep in thought. Then, suddenly exclaiming, "There's only one way out, and it's time to act," he jumped to his feet with a start which sent the birds scattering and scurrying to the nearest cover.

"Good-bye, little birds," he called, throwing the last of his crumbs on the ground. Then he hastened to Communication Headquarters.

That night a dispatch went out to Washington requesting the Bureau of Engineering to send a shipment of vacuum-tubes and sundry other supplies to Punta Delgada.

Evans turned in early in a tranquil frame of mind now, for the die was cast, and slept the sleep of healthy childhood.

The next day a message came from Washington ordering a certain destroyer to proceed at once to Hampton Roads. This particular destroyer had just had a complete refit and her engines were in the best of running order, although these details were not known in Washington. Her skipper was a very good sailorman characterized by a faculty for reaching his destination promptly, even if things didn't go just as he wished; he knew how fast he could safely drive his ship against head seas, and when the need arose he drove her. And yet the schedule for patrol and escort duty was such that — for reasons also unknown in Washington — this ship could be more easily spared at Punta Delgada during the next two weeks than most of the other destroyers. In spite of this fact, Captain Brigham expressed an abundance of resentment at the importunity of the Navy Department for taking away one of his best destroyers just when he would like to have her on hand.

Two hours after this dispatch a series of others arrived,

including one directing Evans to proceed by the first available ship to Washington and report for duty at the Bureau of Engineering.

The destroyer was ready for sea the following morning, and Evans was directed to take passage on her. An hour later she had slipped out of the harbor and headed westward, her officers speculating wildly as to what their sudden mission to home waters could mean. In all there were twice as many hypotheses advanced as there were officers on board, Evans contributing his share, but in the end their conjecturing left them just where they started.

When he arrived in Washington, Evans went to a hotel and took a room. From there he telephoned to Secretary Mortimer and told him of his arrival.

"When can you come and see me?" said Mortimer.

"Any time," answered Evans. "Only wouldn't it be just as well for me not to go too directly from the destroyer to your office? Even in civilian clothes, some one might recognize me and link me up with the ship. Why don't you come here? I'm pretty keen to see you."

"All right; I'll come right over," was the answer. In a few minutes more they were chatting away in the privacy of Evans's room.

Evans described the general condition of the base at Punta Delgada, the destroyer flotilla and the fleet as a whole, and in less than an hour he presented a more effective survey than Mortimer could have got from a month's intensive study of official reports. The fleet was revealed as an organization in its true perspective. When Evans came to the chief of staff, he waxed truly eloquent. Mortimer had listened to the ablest lawyers and political orators, he had heard the most famous after-dinner speakers, but never had he heard so many artistic combinations of

derogatory terms as Evans assembled to convey his impressions of Captain Brigham.

"Sounds as if you had a grudge against the poor fellow," said Mortimer.

"I've got a grudge, all right," answered Evans. "Whether I'm biased by it is another question. I worried myself sick over it for a day and a half, and every angle I could view it from I came to the same conclusion. He's getting the coördination of the fleet so undermined that in action it would hardly be worth the powder to blow it off the map, and that would be forthcoming damn quick from the enemy. It is all right on parade, but in action we should be up against the enemy's team-work, which is marvelous; the best organized business in the world isn't in it compared with them. We should be like a man with half a brain. The coördinating mechanism is so crippled, we shouldn't stand the chance of the proverbial celluloid dog chasing the asbestos cat through hell. The radio business is enough to damn him, but in addition I found evidence that he's doing his best to get the gunnery back to where it was in the pre-Sims days — fine on paper, rotten in practice. He's a first-class stuffed shirt, and the quicker you can scrap him the better."

"What about the Admiral?" asked Mortimer. "Isn't he a pretty good sort? And how does he stand his offending chief of staff?"

"The Admiral is a good man," said Evans. "He is well-trained, standing high in his profession, has fine qualities of leadership, maintains good discipline, and is universally liked and respected. It is a great thing for the morale of the fleet to have such a man at the head. He has a good military personality, but he is a bit old-fashioned, and is rather short on imagination. He doesn't adapt himself

readily to new conditions, but, of course, that's hard for any man of his age. He will do the obvious very well; but I wish he had a little keener perception. Now this stuffed club, Brigham, is the finest ever at keeping up good military form and appearances; the flagship is a very 'smart ship' to look at.

"The Admiral has a touch of the old-fashioned weakness for that sort of thing, and he doesn't know quite enough about the detail of modern methods to see how rotten things are below the surface. You see, he was trained in the days before those things which modern developments have forced us to rely on had become vital. Consequently, he doesn't quite know how to probe his organization and make sure the details are well attended to. He relies on his chief of staff, and it's pretty hard for him to do otherwise. He ought to have a keen, alert, adaptable chief of staff with a real head; then he'd be all right."

Evans then told of Fraser and his experience with him on the submarine hunt. He told how he had searched through the destroyer flotilla and later through the fleet looking for men of real brains and capacity for generalship, and how Fraser had seemed to him to stand head and shoulders above the rest.

"There's the ideal man for chief of staff," he said. "With his tact and personality he would quickly win the Admiral's confidence, and with Fraser at his right hand all the Admiral's good qualities of leadership would stand out at their best. They'd make a splendid combination; Fraser would be the brains, Admiral Johnson the embodiment of authority and formal leadership which would carry weight with the personnel at large, and give the necessary moral support to make Fraser's skill effective."

They continued thrashing out the question and discuss-

ing it from every possible angle till Mortimer was as firmly convinced as Evans that the salvation of the fleet lay in replacing Brigham with Fraser.

Then their talk turned on the more detailed problem of the personnel directly concerned with radio engineering and other communication duties. Commander Rich, it seemed, was as firmly entrenched as ever in the esteem of both Mortimer and Admiral Bishop, the Bureau Chief. Evans, having nothing tangible to support his feeling of uneasiness, did not dwell on that subject.

"I believe, Sam," said Evans, "it would be a very good thing to send Elkins out to be fleet radio officer. He's just the man for the job; and, coming from the Bureau of Engineering, he would have the latest developments fresh in his mind. He'd appreciate the chance to get into the game, and he deserves it. White, who has that job now, is a good man, but he hasn't the brains or the force that Elkins has. I think it would be a good move just to have them swap places. White, coming fresh from the fleet, would be of great value to the Bureau; it always helps to have some one there who is thoroughly familiar with conditions afloat. White has been afloat a good while and might not mind the change, and, anyway, if emphasis is given to the fact that his point of view is needed in the Bureau, rather than that the best brains are now needed in the fleet, he needn't feel that he's being put on the shelf."

"I'll have to find some billet for Brigham where he'll be comparatively harmless; — perhaps commandant of the Great Lakes District or of the Naval Prison," said Mortimer.

"Yes," said Evans. "Or put him in command of the old *Constitution* tied up in her tomb at the Boston Navy Yard, where they show off the relics and hoist the flag every

morning at eight-bells to set the pace for the Yard. He'd make them get the flag up on time, all right. Put him in charge of a bunch of incompetents who'll be no good, anyway, and let him teach them an officer-like bearing.

"As to White, I wouldn't transfer him at the same time as Brigham, it would draw too much attention to the sweeping change; besides, it would be too tough on White to bracket him with that old dummy. Get Brigham out first; then in a week or so you could let Elkins go out to relieve White."

The next day Mortimer set the machinery in motion to promote Fraser from commander to captain in order that he should have the necessary rank, and then to make him chief of staff in place of Brigham.

When the news of this change reached the fleet, it caused a considerable commotion. Speculation as to the occasion of it constituted the burden of the wardroom gossip for several days. Some few officers tried to connect it in some way with the sudden and mysterious departure of the destroyer for Hampton Roads, but their ingenuity failed them, and the idea was dismissed as quite impossible.

On the journey home in the destroyer a somewhat new problem had engaged Evans's attention. It is a recognized principle that secret codes must be changed frequently. Enemy experts are constantly at work studying the radio messages which their operators have intercepted, and it is granted that in time they will gather sufficient data to work out any code. It has been said that ten days is as long as it is safe to use one code. Evans had time to spare on this destroyer trip, and he found a fascinating occupation in trying to devise a new system of codes more baffling to the enemy. He finally hit on a scheme which would render the codes so difficult to unravel that he felt sure

they could be trusted for fully twice as long as those then in use.

When in Washington, after his conference with Mortimer, he sought Commander Barton, of the Intelligence Bureau, with whom he had worked in London over the establishment of communication with Heringham, and laid his scheme before him. Barton was well pleased with the plan and requested Evans to work out the details of his system. For the next fortnight, Evans was busily engaged in this task, first devising and planning the system and then arranging for the printing of the necessary code books. Not content with one system, he devised another so different that even should the enemy become thoroughly acquainted with the first, it would give them no clue at all to the second. In fact, his productivity in this line reached such a point that a less enthusiastic and enterprising man than Barton would have begged him to give o'er.

During these days Evans also gave a large share of his time to the Bureau of Engineering where he got his finger once more in the pie of radio engineering progress. His experience with the fleet had given him a somewhat new point of view which led to a number of practical suggestions. Many bright ideas which had developed in the planning rooms had to be snubbed because utterly unsuited to conditions afloat.

As before, he found himself acting informally as liaison officer between the Bureau of Engineering and the office of the Director of Naval Communications. He found loose ends in the way of fitting the more highly specialized apparatus to the intricate uses for which it was required, and the problem thus raised brought him closely in touch with the radio men in Communication Headquarters.

There was one man attached to the office of the Director

of Naval Communications who especially attracted his interest and attention. This was Lieutenant Wellman, a lean man with dark, mobile eyes and an almost uncanny look of penetration. He had recently been attached to this office, and had a reputation of great knowledge of telephone and telegraph systems and all manner of communication problems. Just as Evans spent much of his time at the D.N.C. office, so Wellman spent much of his at the Bureau of Engineering, where he was on friendly terms with the officers in the Radio Division from Commander Rich down. Evans found him alert and ready with an intellectual grasp of the problems before them, and eager for technical knowledge, especially of the newer radio methods. These Evans discussed with him at some length, but his own gift for inquiry was such that in their talk Evans did most of the questioning and Wellman most of the telling.

Evans also spent more than one evening in conference with Mortimer. With mutual profit they viewed the war in its larger perspective, and unearthed its salient features from amidst the jumble of apparently unrelated facts.

The situation, boiled down to its essentials, was much as it had been at the time of their earlier talks before Evans went to the fleet. The increased destruction of enemy submarines had facilitated the shipping of supplies to Northern Europe, but in this respect the situation was still critical. Every submarine that could be destroyed would help to turn the balance.

"The soldiers we are sending over help the morale of the Allies and aid them materially in holding the line," said Evans, "but do you think they'll ever push it back enough to win the war that way?"

Mortimer shook his head. "It doesn't look like it."

"I fear all the man power of Northern Europe and North

America combined would be expended in pushing through to a decision on land," said Evans, frowning.

"They depend on their sea power to such an extent that if we could strike hard at that, we could paralyze them," said Mortimer. "Don't you think so?"

"Yes," said Evans, "and they know it and are guarding their fleet mighty carefully. Conversely, if they could smash our fleet, they'd finish us. And if they saw what looked like a good chance, they'd try it. It would be the most colossal sea battle in history, if those two fleets met in the open sea. With Fraser on the job and a slight advantage of visibility or other weather conditions on our side, such as we might get if we could choose our time with Jeremy's help, I believe we could be reasonably sure of doing them in; at least enough to justify seeking an engagement."

"Can't you think of any scheme for baiting them to action at such a time?" said Mortimer.

Evans pondered awhile. "I have a wild scheme in my head," he said. "It's one of those notions of which I'm the victim now and then."

"Let's have it," said Mortimer.

Evans then propounded a series of imaginary situations and their strategical and tactical developments, which aroused in Mortimer a strange alternation of enthusiasm and doubt. At the end he felt enough conviction that there was merit in the scheme to satisfy him that it should in some way be followed up.

"Don't you think I had better take this up with the General Staff, and send some suggestion to the Admiral?" he asked.

"No," answered Evans. "Admirals don't like their strategy and tactics fed to them by civilian secretaries

much better than by gunners. Besides, it's probably full of weak points, as I've outlined it. I'm not a trained admiral, you know. Anyway, give them a chance to work it out themselves, and they'll probably improve on it in doing so. If the premises are sufficiently suggestive to the Staff at Punta Delgada, they may easily hit on the main ideas, or something better. Fraser's a wizard at that sort of thing."

"So, you fancy the premises can be made sufficiently suggestive?" said Mortimer.

"I shouldn't wonder a bit," answered Evans with a smile.

"See here!" said Mortimer. "It's damn silly for you to be going on as a warrant officer. You ought to be taking the responsibilities you know how to handle, and taking them squarely. I could work the regulations now so as to have you promoted to commander very quickly, and it wouldn't be long before you'd be a captain. Then you could fit into the fleet more nearly where you belong."

"Oh, come," said Evans. "I wouldn't know what to do with all that rank, and I should be looked on with suspicion and jealousy. I'd always be having to buck the resulting hostility. No, no, Sam, I can carry on much better as I am, doing things in my own way. For one thing, I find it an enormous advantage to be able to get right into the game as I've done on the destroyers, particularly on that sub hunt, and see how things really are. The more gold braid you have on, the less things look as they really are when you go to look at them."

"I'd give my eye teeth to get into the fleet and really see how things are going," said Mortimer.

"That's just it," said Evans. "You don't suppose you could go aboard the ships as Mr. Secretary and see things

as they really are, do you? Every one would be in his best uniform, full dress, at attention, the band playing and nothing doing; no war going on at all."

"That's so," said Mortimer; "but I'm afraid your fondness for tinkering with apparatus will lead you to do too much of that, and distract you from the bigger problems you ought to be thinking about."

"I know that's my vice," answered Evans, "but the appeal of the game as a whole will draw my thoughts in that direction to the extent of daydreams quite bold enough for all practical purposes — bold enough to make the gold braid snub me good and plenty if they knew what I was thinking about. I need some manual work to keep me normal, to occupy my hands and lower nerve centers while I'm thinking about some of the knotty problems that come up. Some tangible part of the machinery in my hands and before my eyes will help the whole plan of its use to take shape in my mind."

For some time they argued the pros and cons, and at last Mortimer somewhat reluctantly yielded and consented to let Evans return to the fleet as a radio gunner.

It was also decided that in the near future Commander Barton should proceed to Punta Delgada to direct the work of the Bureau of Naval Intelligence there, since it had now definitely become the storm-center of naval activity.

During the days that remained before Evans was to return to the fleet, he was kept busy completing the new systems of secret codes for Commander Barton, and conferring with various officials in the Bureau of Engineering and in the office of the Director of Naval Communications. In the latter office he had many conversations with Lieutenant Wellman, and with each conversation he became more interested in the man, seeing in him great possibilities in

connection with the coördinated machinery of communications and Naval Intelligence. It transpired that Wellman had traveled extensively, was an accomplished linguist, and possessed considerable knowledge of enemy country. It was, therefore, suggested that he should confer with Commander Barton to see how far his qualifications might render him useful to the Bureau of Naval Intelligence.

On the particular morning when Lieutenant Wellman was awaiting this conference, Evans came to Barton's office with some copies of one of his new secret codes, fresh from the printer. Leading to the inner office was an anteroom, at the outer door of which stood a sentry whose duty it was to see that none but officers and others with proper credentials entered. Evans came with the bundle of code books under his arm, and muttered a password to the sentry, who pressed a button just inside the door, at which Commander Barton rose from his desk in the inner office and came to the door between it and the anteroom. Seeing Evans at the outer door, he called to him to come in. In the anteroom sat Lieutenant Wellman waiting till it should suit Commander Barton's convenience to confer with him; as he sat there his dark, penetrating eyes traveled restlessly about the room observing and noting everything that human observation could encompass. Evans, seeing Wellman alone there, exchanged greetings with him, and passed on into the inner office. He opened the bundle and handed the six books it contained to Barton.

Wellman, following Evans with his eye, silently shifted his seat so that he could watch the proceedings through the half-open door.

Barton took the books and thanked Evans, who then left the room. Barton opened one of the books and glanced through it rather hastily, postponing a more careful ex-

amination till he should have more time. Then he unlocked a drawer in his desk and put the six books into it. He was just closing the drawer when a yeoman entered from a side door rather hurriedly, saying:

"There's a long-distance call from San Francisco; your desk phone is being repaired, so I've had the call plugged into the sound-proof booth."

Commander Barton jumped up and, followed by the yeoman, hurried out through the side door to answer the telephone. It was only for a few seconds that the room was deserted, but in those seconds Wellman slipped in, took one copy of the new secret code from the drawer, and slipped out again, tucking it under his coat as he went. Leaving the anteroom as one who has transacted his business, he returned the salute of the sentry, and walked briskly away down the corridor, passing Evans, who was walking slowly, so absorbed in his thoughts that it seemed a pity to disturb him — yes, better not interrupt his reverie. In an hour he had left Washington; in five weeks more he arrived in Constantinople, no longer in the uniform of a United States naval officer, carrying in his satchel the treasured code book. He was no longer Lieutenant Wellman, but now in his true colors, Commander Bela, of the Turkish Naval Intelligence Service.

Great was the rejoicing at Naval Headquarters when Bela arrived with his prize. Some facts of interest he had obtained while in Washington, but his stay had been cut short by the rare opportunity which had put him in possession of the code book; and this he deemed to be worth so much more than the information he might have obtained by staying longer that he had taken the responsibility of making all possible speed with the book to Headquarters. His prompt decision in so doing was warmly

commended by his chief, who was even more pleased than Bela himself with the unexpected outcome of his mission.

In the code book was a key explaining how it was to be changed monthly to prevent breaking; moreover, the dates were given on which each arrangement was to go into effect. Thus it was evidently good for the decoding of Allied naval messages for several months to come.

In Washington conditions had been especially favorable for Lieutenant Wellman to effect his disappearance unnoticed. His duties had been such as involved extensive traveling, and he had been given an unusually free hand in the arrangement of his own time. Moreover, when it became finally known that he had really disappeared, a variety of rumors explaining the fact passed into circulation in ways that were not generally understood and seemed impossible to trace. No one had seen him take the code book, and it was so long afterwards that his disappearance became known to the officers at Communication Headquarters, that, even had they been disposed to suspect him, it could hardly be expected that his disappearance would in any way lead to a checking-up of the number of copies in Barton's desk.

By the time Bela arrived in Constantinople, Heringham was well established in a post of high authority in the Coalition Government. The men who directed the affairs of this great conspiracy against the liberties of the world included besides Turks those of an extraordinary array of nationalities — Russians, Italians, Bulgars, Jews, Egyptians, and Arabs. Therefore a well-disguised Englishman with Heringham's rare gift of impersonation might well fit into the organization without exciting suspicion. Yet Bela, on finding a stranger to him in such an important position, was strongly inclined to distrust him. He made guarded

inquiries. Nothing of a compromising nature was known about him. On every hand Bela was assured that this official, with his extensive knowledge of the nations allied against the coalition, had rendered most valuable services to the cause. Still Bela suspected. Finally he contrived to have an interview with Heringham alone, and sought to probe the case. After feeling his way for some time with guarded questions, he asked Heringham rather suddenly if he had not lived for some time in England. Heringham, still in the Turkish language and with phrasing and intonation perfectly reproducing the diction of a thoroughbred Turk, replied casually, "Indeed I have. I know the little sea-girt island well."

Then in a jocular vein he added in the English language, aping the English manner of speech in a mocking tone, yet betraying an unmistakable Turkish accent, "Have you been in Picadilly? I say, it's a topping place, you know!"

The easy and confiding smile with which he cast this bit of ridicule on the Briton was altogether disarming; and when he added in Turkish, "What fools those British are!" Bela could hardly conceive that any but a true Turk could have spoken so.

But now it was Heringham's turn to take the initiative. He questioned Bela about his recent trip to America, and listened with admiration and wonder to the tale of his exploits in finding his way into the confidence of high officers in the Navy Department. With warm praise Heringham drew forth more and more of the story, and as his frank appreciation dispelled the last of Bela's doubts, this cautious Turk ended by giving him a full recital of the information he had gained of radio affairs in the Allied Navy. One thing, however, Bela did not divulge; he said nothing to Heringham of the stolen code book.

A few days after Wellman's uncanny disappearance, Evans received his orders to return to Punta Delgada and report for radio duty on board the flagship. It was now early in November, and the autumn colors were fading on the shores of the Chesapeake Bay as the cruiser on which both Elkins and Evans took passage left the Virginia Capes and stood out to sea. In a few days they sighted the greener shores of the Azores, where in the outer harbor of Punta Delgada the new battleship *Delaware*, the flagship, lay majestically at anchor, queen of the Allied Navy.

CHAPTER VIII

DISPATCHING THE SECRET MESSENGER

EVANS now lived aboard the battleship *Delaware*, Admiral Johnson's flagship; and here the life was different, indeed, from that on the mother-ship of the destroyer flotilla. He found himself one of a large number of warrant officers, some real old-timers, but most of them much younger men than himself. To his great delight he found on board the *Delaware* his old friend Lindsay, erstwhile radio officer of the cruiser that had taken him to England. Lindsay had now risen to the rank of lieutenant and was in command of a turret on the great superdreadnought, but the same sunny disposition and cordial informality were unchanged; he still was not too proud to associate with a warrant officer.

Lindsay knew how to enjoy himself on an evening ashore; he had a faculty for finding out when there was any merry-making going on, and for being there. Evans, having little time or inclination to join in the crude pleasures which most of his fellow warrant officers sought in the town, now found real refreshment in knocking about on shore with Lindsay, the natural geniality of the youth being of a compelling sort. He managed to get Lindsay talking more than once about his own affairs, and learned that in his home in the Middle West his widowed mother depended on his savings as her chief means of support.

Now there are haunts in Punta Delgada where a visitor may find a roulette wheel spinning merrily of an evening. The scraps of paper representing Portuguese money fly hither and thither on the long table, and ever like a Neme-

sis the treasurer rakes them in as a man rakes in the autumn leaves that strew the road. He who frequents the roulette wheel often becomes poorer — else there would not be roulette wheels.

Now this game had a fatal fascination for Lindsay, who was one of those individuals that love to take a chance, and can always persuade themselves that next time they'll make a pile. Once he had won a surprising sum of money at roulette and had sent it home to his mother before the opportunity to lose it again had beset him. Since then his earnings had nearly all fallen into the hungry maw of the spinning wheel. The most pathetic feature of the case was the way his eagerness to send more money home kept luring the incautious youth into taking another chance at the losing game.

Once on the evening before the fleet was to put to sea for some maneuver, Evans, dead tired from his arduous toil, was planning to go to bed early and get a long sleep. As supper-time drew near, Lindsay, making for the gangway to catch the last boat taking a liberty party ashore, chanced to meet Evans on deck.

"Are you coming ashore? It's going to be a great night on the beach," he said.

"I guess I'll stay aboard and turn in early."

"Oh, come on, be a sport, old man," said Lindsay genially. "Lord knows where we're going on this cruise or when we'll get back; there'll be all kinds of fun in town to-night."

"You'll have to break out a pile of excitement to get me ashore to-night."

"Why, what's the matter with you?"

"I suppose I've been hitting too hot a pace," said Evans with an enigmatic look on his face.

"Oh, quit your kidding, and come ashore," said Lindsay. Evans hesitated a minute.

"The fact is, I'm kind of tired and don't seem to feel like hunting all the hilarity there is," he said, "but there's a little restaurant that you may not know of where you can get a good supper and hear some rather good music; it's a quiet place and most of the men don't seem to know it. If you'd like to go and have supper there on me and have a good heart-to-heart talk, that would suit me as well as staying on board."

"All right, I'll go and try your quiet restaurant with you, for a starter, anyway."

So off they went and took their places in the motor sailer at the gangway. Once ashore, Evans led the way through the crooked streets to a picturesque little building where a modest restaurant served a few familiar patrons. A small orchestra consisting of a piano, a double-bass 'cello, and one or two other instruments, ensconced in a nook by some potted palms, beguiled the supper hour for such as sought the little hostelry. Evans and Lindsay, alone save for two natives of the town, chose a table from which they could look out over the harbor, and just near enough the orchestra to get the full benefit of the music. Lindsay at first felt a little dismayed at the lack of gayety which seemed destined to characterize the celebration of his night on shore, but soon the appetizing food and the melodious strains of a Portuguese air put him in a mood for the enjoyment of a quiet evening chatting freely with his friend. Evans was more than ten years his senior, but of that Lindsay had no suspicion. Their talk drifted easily from the personnel of the flagship through a wide range of human affairs. The orchestra, after a brief rest, struck up a Strauss waltz, once familiar to all, now known only to

those of Evans's age and older. Evans stopped talking and listened, a far-away look coming into his eyes, and his hand unconsciously beating time on the table.

"Lord! how that takes me back to old times!" he said.

Their talk drifted back to the States, and into speculation as to what people were thinking and doing at home. The orchestra paused again, and then began to play a song once popular in all modern cities, now long since out of fashion, a song whose melodious sweetness had made it a favorite in its day and commended it now to the little Portuguese orchestra, guided more by melody than by vogue. As Lindsay recognized the tune, vivid memories of his childhood rose before him; and as the rich, deep tones of the double-bass 'cello vibrated with the appealing spirit of the melody, the long-forgotten past swept over him like a flood; his eyes became moist, and he sat in silence till the music had ceased for some time. Then he spoke, and told Evans of the early memories awakened by the song. He felt that he could speak to Evans of things he couldn't mention to his other shipmates, for Evans understood. And so it was that the youth poured out his heart to the older man, giving vent to feelings long deeply repressed within him. He told of his concern about his mother, his zeal to bring her no shame, his hopes and ambitions, his temptations and struggles. And in all this he found what without knowing it he had craved since leaving home — the confidence of a friend on whom he could lean as on an older brother.

Evans in his turn found in this intimacy with the younger man something that satisfied a long-felt want; and he thanked his stars for it. With a deepening bond of sympathy they talked till the players had packed up their

instruments and gone. All thoughts of seeking the usual pleasures of the town had now evaporated, and it was only when the time came to catch the last boat returning to the flagship that they left the little restaurant and walked down to the landing.

Next day Lindsay's monthly pay, which had been lying restless in his pocket the night before, was dispatched intact to his mother in the Middle West.

About the middle of November, a few days after Evans and Elkins arrived at Punta Delgada, Commander Barton also arrived from Washington and took charge of the Naval Intelligence service at Communication Headquarters on shore. Before leaving Washington he interviewed an officer who rendered notable service in finding men for unusual duties. If a man was needed to make a corner in glue for the Government, or to deliver a consignment of homing pigeons in Northern Russia, he would find just the man for the job. To this officer Barton made the request that as soon as possible a man, with experience as a spy in enemy territory and with some knowledge of radio, be chosen for important duties at the Azores and elsewhere. He was to be enrolled as a chief petty officer and sent to Punta Delgada to report at Communication Headquarters.

Barton's parting injunctions were, "Much will depend on him; look him over well, and be sure he's a real man."

About three weeks after this, while Evans was in the radio room of the flagship busily engaged in the congenial task of rehabilitating this vital nerve center of the fleet and undoing the damage wrought by Brigham, he received a cryptic message from Commander Barton intimating that a friend had arrived from home whom he would like Evans to see.

Evans obtained permission for shore liberty and pro-

ceeded to Communication Headquarters. There he learned that the man requested by Barton "for important duties" had arrived, a man of thirty-six named Kendrick. He had been an army spy, who, being sent by aeroplane behind enemy lines, had been for some weeks performing valuable duties in Spain, and had just returned successfully to Washington. By some maneuver of which very few are master, great masses of red-tape had been cut, and he had been transferred to the navy, enrolled as a chief radio electrician and sent at once to Punta Delgada. He had as yet been kept completely in the dark as to the nature of the duties for which he had been sent.

Evans opened conversation with him informally and questioned him concerning his experiences in enemy countries, then as to his knowledge of radio. After a somewhat prolonged interview in some of which Barton took part, Kendrick was still quite in the dark as to the real object of his mission, although given clearly to understand that it had to do with radio communication.

During their talk Evans watched closely the play of Kendrick's features, and said to himself, "He looks like three or four men in one; I guess he's what we're after."

But along with this reflection came the disquieting thought — "What if he's one man too many?"

Perhaps there was more in his performance in enemy country than was known to the Army Intelligence Service. Cases were by no means unknown in which the most valued spies had been really in the enemy employ. Keenly Evans sought to sense all that lay beneath this mobile exterior as they talked. But this was a task for some one other than a scientist. He longed for the power of a master sleuth.

We are all quite accustomed to trusting our lives to the nervous coördination of a taxicab driver, and thinking

nothing of it. But when the fate of the world may hang on the sensory impressions, the resulting nerve impulses in the brain and the emotional responses thereby aroused in one individual by barely perceptible motions in the features of another, we may well consider the great importance of little things, especially if those little things be nerve impulses.

That this man had been a consummately successful spy there could be no doubt. But the question whom he had fooled, Evans dared not consider settled to his satisfaction without further scrutiny. He imparted his wonderings to Barton when they were alone, and, though the latter at first inclined to regard the suspicion as fanciful and too improbable for serious consideration, he finally agreed that they had better scrutinize their man for a few days before revealing to him much of his real task.

During the next week Evans spent a good part of his time training Kendrick in the use of certain radio apparatus, and at the same time striving to assure himself as to his loyalty. Gradually the conviction grew in both Barton and Evans that Kendrick was a man they could trust without fear, but still they said little to him of his mission.

About this time there arrived from the States a long, narrow crate addressed to Evans. The supply clerk who handled the shipment remarked — "That's some box, Gunner; what do you expect's in it?"

"Looks like an eight-day clock," was the answer. "Still, my watch keeps pretty good time," he added with a puzzled look.

"Do you want to open it here?" asked the clerk.

"No; it will litter things up to scatter the crate round here. I'll get it lugged down to the shore where I can turn it adrift."

So some hands were summoned and, having moved the crate down to the shore, were dismissed. Evans then opened it by himself. The wildest guess which the supply clerk could have made as to its contents would have been far from the truth, for never in his life had he seen such an object. It contained a sort of narrow, decked-over canoe built essentially on the lines of an Eskimo kayak. To the unfamiliar observer it would give the impression of frailty such that he who would venture beyond easy swimming distance from shore in such a craft must be foolhardy to the verge of madness. In point of fact, as the Eskimo well knows, this type of boat is so seaworthy as to be safe in almost any gale that blows.

Evans had a friend who had traveled much among the Eskimos and studied their ways, and especially the handling of their kayaks. This man had built himself two or three of these light craft, patterned in the main on the lines used by the Eskimos, and in years gone by had taught Evans to handle them in rough water. It was one of these that he had now placed at Evans's disposal.

As he ripped off the last of the crate and brought to view the graceful lines of the little craft, Evans smiled at the memory of pleasant hours spent paddling off the rough New England coast. He fitted together the two halves of the double-bladed paddle which came with her, then lifted the kayak on his shoulder, carried her to the water's edge and launched her. Then, getting in and sitting in the bottom, Eskimo-fashion, he paddled away along the shore. With a thrill of joy he felt the familiar responsive motion as the light and buoyant little craft sped forward. Skirting the shore line, he came in a few minutes to a secluded and unfrequented spot where the contour of the rocks afforded a sheltered and convenient place to land. Lifting the

kayak out of the water, he concealed her well above high-water mark.

The next day he took Kendrick to the spot where the kayak lay hidden, dragged her out into view, and said:

"Do you think you could make a landing on an exposed seacoast in that?"

Kendrick stared at the delicate-looking craft and answered, "Well, if you asked me if I thought I could swim over Niagara Falls without inconvenience, I should about as soon say 'yes.'"

Evans laughed. "Oh, it isn't as bad as that. I've a friend who used to play in that kayak by the hour in the ocean surf where it breaks on outlying ledges, just for the fun of it, and I've done it more or less myself. I'll teach you the game; I expect we shall want you to do something like that pretty soon. It's surprising how little violence there is in big waves if you float freely on them in a small boat. A tennis ball suffers little violence in a sea that pounds a battleship with a stress measured in tons. It's only rough if you resist it. If you stay just outside where the waves actually break, their motion is all up and down; you can sit there at your leisure and study the situation farther in. Let me show you how it works. I'll paddle round the point to where there's a moderate sea breaking; you can follow along the shore and see for yourself how simple it is."

So saying he launched the kayak and paddled out round the rocky point to where he felt the heave of the ocean swell. Kendrick followed along the shore watching him curiously. Evans paddled close to the shore keeping just where the waves curled up before they broke on the rocks. Presently he found a place to his liking and, turning the bow of the kayak toward the shore, rested as he studied the action of the breaking waves between him and Kendrick,

who stood watching from a high rock just above. Some thirty feet from the actual shore line was a barrier of rock, the highest part of which rose clear above the water, while even the lowest part was barely uncovered in the trough of the largest waves. Over this ledge the seas broke, each wave sending a torrent of frothy water into the deeper pool beyond, which seethed like a cauldron streaked with shifting patterns of foam; and as each wave receded another torrent would flow out over the ledge till, balked by the crest of an incoming wave, it was lost in a smother of white foam. As the kayak rose and fell on the waves, its pointed bow barely beyond the edge of this dangerous-looking reef, Kendrick wondered that it was not caught by the inward rush of water and dashed on the rocks. Presently, just as a good-sized wave came rolling in and curled right under the kayak before breaking, he saw Evans give a few quick strokes which carried him forward on the crest of the wave. It broke, and in the midst of the great mass of white water pouring in over the ledge came the kayak, floating lightly till well within the pool where on the agitated waters she bobbed up and down like an eggshell, while Evans rested his paddle on the cockpit combing as if taking his ease on a millpond. Then looking at the shore line he chose a gently sloping shelf of rock which was half-submerged when the pool was filled by the larger waves, but which each receding wave left bare, and, paddling swiftly forward on the crest of a large wave, grounded, and thrusting his paddle firmly into a niche in the rock held himself there as the water poured back off the shelf. Then, jumping out, he seized the kayak and ran with it up to the dry rocks above without even wetting his feet.

Sitting down beside Kendrick who felt as if some miracle had brought him safely ashore, he said: "You see, if you

find a place like this it really isn't hard at all; and you can almost always find a place as good as this, if you hunt for it. The main thing to remember is that the waves aren't all alike. Sometimes a small wave will recede so quickly that you'll be caught on the rocks just when you think you're going over them. You must take your time and watch a lot of them till you know what sort of thing they do; then choose your wave as you see it coming."

"I suppose you'll want to take the boat back overland," said Kendrick. "You couldn't very well get out again through that, could you?"

"Quite easily," said Evans. "I'll show you how that works. After a big wave there's a lot of water going out, enough to float you over the ledge."

"But wouldn't the next wave coming in swamp you?"

"Not at all. That's the beauty of a decked-in boat like this. It doesn't matter if she buries her nose well under water, she'll ship very little over the cockpit combing. Another thing — the main secret of her seaworthiness is the fact that you sit in the bottom; your center of gravity is so low that you have enormous stability. Big waves can break on you broadside without tipping you over. If you watch her closely and see how she behaves in breaking waves for a while, you'll get the idea of the thing better than I can tell it to you."

So saying, Evans carried the kayak down to his landing-place on the sloping shelf, and, watching his chance, put her down as a wave receded, climbed in, and waited for another to come and float him off. On the next large wave, foamy and tumultuous though it was, he floated gently off the rock and shoved himself out into deep water. Kendrick watched intently as he paddled out till the bow of the kayak was just over the inner edge of the rocky barrier. A

big wave came rushing in and as it broke seemed to engulf the sharp bow of the kayak, then lifted it high into the air as if to turn her over backwards and throw her across the pool. But instead she rose gracefully as the crest passed under her, and the next moment Evans was paddling her swiftly into the stream of water already starting to pour out over the ledge. Gliding smoothly out, he plunged into the next wave just as it broke on the outer edge of the reef, and almost disappeared from view in the white froth. But again the kayak rose as the crest passed under her, and now she was riding like a duck on the heaving waters beyond the reef. Several times Evans rode this buoyant craft in and out of the pool in order to familiarize Kendrick with her behavior under such conditions, and incidentally, it must be admitted, for the sport of the thing. Then he paddled back round the point to the hiding-place of the kayak, where he explained to Kendrick what he was there for.

"We want you to go to Gibraltar," he said. "And the quickest way of getting you there from here unobserved seems to be to have you land in this thing somewhere near Cape Trafalgar. You can't land where there are people; that's why it has to be on an exposed coast instead of a snug harbor, although you might work the mouth of a small stream. I suppose you can manage to get to Gibraltar without exciting suspicion, once you get ashore, can't you?"

"Once I get ashore, yes," answered Kendrick. "Once I get ashore, I can manage the rest easy; it's getting ashore in that damn thing that worries me."

"If I were in your shoes it would be the other way round," said Evans. "Landing in the kayak is play. But to smuggle myself into a stronghold of the enemy as one of

them; ye gods! I'd be paralyzed at the start and wouldn't know where to begin."

"It's all in what you're used to," said Kendrick. "I'm so used to knocking round Spain and bluffing my way along, it's more or less second nature."

"Your game is very different from ours here at Headquarters," said Evans, musing. "We can play our game something like chess, taking our time to think out the next move. Your game is more like tennis. You've got to hit the ball when it comes and place it where the other fellow can't get it, and your time to act is measured in hundredths of a second."

He then went on to explain to Kendrick the purpose of his mission, and told him how Heringham was established in Constantinople with radio operators in enemy stations for the purpose of communicating with the Allies. But the distance from Constantinople to the Azores hampered direct radio communication, and it was therefore important to install another radio man at Gibraltar to relay messages between Constantinople and Punta Delgada. His problem was to get himself established as an operator in the main radio station of the enemy at Gibraltar. In the art of making himself acceptable and trusted by the enemy he was a master, almost if not quite unsurpassed. How to proceed to do this was to be left to him.

"Commander Barton will give you points about establishing communication with Heringham," said Evans. "My job is to show you how to adapt their apparatus to your needs, once you get your hands on it, and how to superpose your messages to us on their regular traffic; also to teach you how to get ashore safely in this kayak."

It was planned, he explained, to have a seaplane take him and the kayak at early dawn to a point within easy

paddling distance of the Spanish coast and leave him to find a landing-place where he could approach with the least risk of detection, landing preferably at dusk.

"With the help of our weather experts," said Evans, "we can choose a day when the sea will be calm. And now why don't you get into the kayak and start getting the feel of her as soon as possible? Paddle a few miles in smooth water before you try landing where it's rough, and you'll be surprised to find how quickly you get a sense of stability."

So Kendrick began a series of lessons in a form of seamanship which till that morning he didn't know existed. At first it was with some nervousness that he stepped into the narrow craft and, when seated, anxiously pushed off from the shore. But before long he was quite at home in her and paddling a good stroke; and then Evans began to initiate him into the art of handling her in the surf, which he soon learned was largely a matter of "watchful waiting" and then letting the waves do the work.

But during these days exercises in the surf were incidental; the principal task was teaching Kendrick all he needed to know of radio apparatus and methods, and the special ciphers he was to use for weaving his messages into the enemy traffic.

He might not gain access to a transmitter of sufficient power to reach the Azores, even if the best receivers then in use were ready to pick up his signals. With this difficulty in mind Evans had been experimenting with a new device which had occurred to him for making the receiver on the flagship more sensitive and at the same time more selective, that he might pick out the desired signal, though incredibly faint, from all those abroad in the vibrating ether. As soon as Kendrick had learned his duties and a

suitable day should come he was to go, for his services in Gibraltar were much needed. Evans felt sure his device would work, but it must be installed in the flagship and tested in actual use, and this if possible before Kendrick's departure, lest its failure should entail some modification of his instructions. For this, quick work was required.

About this time a new batch of ensigns, recruited from civil life and put through a four months' course at the Naval Academy, arrived at Punta Delgada and were distributed to various billets in the fleet. Among them was a youth named Coffee, alert, smartly dressed, and truly a marvel for etiquette. By the caprice of fortune, this ensign was assigned to the communication force on the flagship as an assistant to the fleet radio officer. As soon as he was thus established, he took occasion to make it clear to all the radio personnel of inferior rank to himself, including Evans, that their duties came under his jurisdiction; there was to be no misunderstanding about that.

One Saturday morning when the work of installing the new device in the receiver was nearing completion, Evans asked the chief radio electrician if he could spare one of the operators to assist him with the job.

"It's almost time for captain's inspection, sir," said the chief. "The boys ain't supposed to be in their dungarees then."

"Oh, well," said Evans, "I can manage about as well by myself. There's not much room for more than one pair of hands on this job, anyway."

So saying, he clambered and squirmed in behind a varied assortment of apparatus constituting the vitals of the radio room, and in his old dungarees sat down on the steel deck. With knife and pliers he swiftly fashioned the labyrinth of wires which was to put his new receiving device to the test

of actual use, the tar of the insulation rapidly turning his hands a dark brown. As he worked away with the joy of one in his native element, he whistled a tune of his early childhood, and soon was quite oblivious of his surroundings. The door of the radio room opened and footsteps approached, followed by more footsteps. For a while Evans continued to scrape and bend his wires, still whistling as he worked. Presently he looked up. There stood the captain of the flagship, and beside him Fraser, chief of staff; behind them was Lieutenant-Commander Elkins and his new assistant, Ensign Coffee. The radio chief and his force of electricians stood at attention for the formalities of the captain's inspection, but the captain, attracted by the sound of whistling, was peering with a look of mild surprise through the maze of electrical gear at the unusual sight of a man who had failed to stop working for inspection. Evans caught Fraser's eye and saw there the suggestion of a smile which bespoke enjoyment of the contrast between this unwonted spectacle and the rest of the ship during inspection. But Coffee was glaring at him with a terrible look of affronted dignity, and this in turn provoked the suggestion of a twinkle in Evans's eye.

The captain glanced around the room and passed on, followed by the other officers. But in a moment Coffee returned and in a sharp voice called — "Gunner! Come out here, I wish to speak to you."

Evans crawled out through the interstices in the gear.

"What do you mean by being in dirty dungarees at captain's inspection?" said Coffee.

"There were changes to be made in the apparatus; they're needed rather urgently," answered Evans. "Some captains would rather see work going on than idleness; I rather thought our skipper was that kind."

"There's a time for work of that sort," answered Coffee stiffly, "and there are persons assigned to do it. Didn't you know that an officer — even a warrant officer — isn't supposed to do the manual work of an electrician?"

"I'm afraid I didn't," answered Evans; "in fact, in the war with Germany, I heard the skipper of a destroyer rebuking a junior lieutenant for saying just that to an ensign."

Coffee bit his lip and gulped, then drew himself up straighter than ever and said: "Well, understand hereafter that at Captain's inspection you are to be in full uniform standing at attention."

With these words he turned and marched out of the radio room.

But Coffee was not wholly satisfied with the success of his effort to improve Evans's morale. Therefore, early in the afternoon he sent a message to Evans commanding his immediate presence in his room. When the messenger arrived and delivered his message, Evans, pliers in hand, was racing against time. If he could complete the installation of his new device in half an hour, he would be in time to test it by listening in on a schedule of signals from a distant station, and in his eagerness to see if it would fulfill his expectations he worked at a feverish speed.

On receipt of Coffee's message he seized a piece of paper and wrote on it: "Am hastening to complete installation in time for J X Z schedule. If you approve, please give me written instructions to continue till job is completed."

Handing it to the messenger he said: "Take that to Commander Elkins in the Flag Office, and wait for an answer."

Then he continued to cut and fit the wires, handling them now and then with an almost vicious aggressiveness. Soon the messenger returned with the desired instructions.

"Please tell Mr. Coffee," said Evans, "that Commander Elkins has instructed me to continue at this installation till it is completed."

Soon the job was done. Hot and grimy, Evans seized the head-phones, made his adjustments and listened. The schedule began and the signals continued for some time, during which a variety of tests and measurements were needed to determine the success of the new device. In part these tests were satisfactory, but they revealed the need of further study and modification. The schedule over, Evans went to his room deep in thought, and was cleaning up preparatory to a session of slide-rule calculations, when again a messenger came from Coffee demanding his presence. Coffee had seen him walking slowly toward his room, and the installation was therefore no longer an "alibi." To Coffee's room he went and presented himself meekly at the door.

"Gunner," said Coffee with great dignity, "you are not taking your duties in the right spirit. You excuse yourself from observing the amenities on board ship on account of a wiring job. You must understand that discipline and morale are more important than apparatus.

"Now I want to see if you are up to standard in the matter of those things we expect all of you to know. I'll just ask you a few questions. Can you tell me what is meant by the cadence?"

"The cadence?" answered Evans. "The only kind of cadence I know of is the concluding phrase in a piece of music."

"Music!" echoed Coffee. "You'll have to face more music than you like if you don't look out. The cadence is something which every second-class seaman is supposed to know, as you will see if you consult your Blue-Jacket's

Manual," and he held up a copy of this book to give emphasis to his words. He then tried one or two more questions about infantry maneuvers, unearthing in Evans a woeful degree of ignorance, which in no wise eased the outraged state of his mind. Finally he summoned a messenger and sent him for a rifle. When it was brought he handed it to Evans and said:

"Now let me see you demonstrate the maneuvers in the Manual of Arms as you would to a raw recruit."

Evans took the rifle and examined the mechanism of the breech for a moment, then looked up at Coffee and said:

"Really, it's no use my trying to do that. It's so long since I had anything to do with that sort of thing that I've forgotten the whole of it."

With these words he handed the gun back to Coffee, who received it with a gesture of contempt and said:

"And you a gunner! How, in Heaven's name, did you ever get your rating?"

"Perhaps you'd get that best from the officers that enrolled me," answered Evans mildly.

"Don't you ever say 'Sir' in speaking to a superior officer?" asked Coffee sharply.

"Not often; in fact, come to think of it, I don't know that I ever do. Most officers I talk with don't seem to care much whether I do or not."

Coffee returned to ground on which he felt more comfortable.

"You have shown," he said, "a degree of ignorance which would shame a third-class electrician; in a warrant officer it is appalling; you deserve to be demoted. Go to your room and study your Blue-Jacket's Manual till you know the things every seaman should know; and don't let me

catch you again giving such answers as you've given to-night. That will do."

As Evans retired, he muttered to himself: "What a jolly chap to have about the ship. Well, I trust he's through jawing at me for the present."

The next morning Evans, having with the aid of his trusty slide-rule arrived at a decision as to the method of correcting the remaining weak points in his new receiving device, was making his way to the radio room to apply the results of his calculations. On deck he met Commander Elkins.

"Well, Evans," said he, "what was the matter yesterday? I never knew you to worry about written authority when it came to tinkering with apparatus."

"I guess I must have had a fit of conscience," answered Evans absently.

"Conscience! What made you want to break out a conscience?"

"I just wanted to be sure I wasn't getting insubordinate."

"Who's been putting that kind of idea in your head?" said Elkins.

"Not you," answered Evans.

Commander Elkins looked off over the blue sea with a puzzled expression and watched the speed launches dashing to and fro on their errands among the ships of the fleet. Then, as the truth dawned on him, he turned to Evans and said, "Has Ensign Coffee been bothering you?"

"Since you ask me," said Evans, "he was rather a nuisance yesterday."

"He's young yet," said Elkins, "and takes himself a bit seriously. Then there's another thing; he told me when he came that Commander Rich had spoken to him before he left Washington and told him to keep his eyes open for in-

subordination or unmilitary conduct on the part of warrant officers or chief petty officers with whom he had to do, and, if he found such, to deal severely with it. I don't know why Commander Rich should have said that; it looks as if he had heard some rumors of things being too free and easy and unofficial here in the fleet. Anyway, the fact that Commander Rich saw fit to say that to him has doubtless increased his sense of importance. It will probably wear off; but remember, his rank is above yours, and respect for rank has to be maintained as part of the system. So be as tactful as you can, and try to avoid rows with him, even if it involves a little sacrifice of your working time now and then."

Before the next schedule the remaining defects had been eliminated, and that night Evans felt ready to trust the receiver for the performance of its delicate task. Soon Kendrick's training was complete and all was ready for him to start on his adventurous errand. A few days after Kendrick's departure, Evans was to listen in at stated times every day, and at these times Kendrick was to make a special effort to establish communication.

With the aid of Jeremy at the weather station, a calm spell was chosen in which to send him off. A scout cruiser equipped with the necessary gear for launching a seaplane was ordered to prepare for the voyage, and a fast seaplane was tuned up for a long flight. When the weather conditions were pronounced favorable and the day was set for departure, Evans and Kendrick went as soon as it was dark to the hiding-place of the kayak, Kendrick carrying a nondescript bundle containing his personal effects for the voyage, including the means of effecting a wonderful array of disguises. Evans helped him launch the kayak, and exhorted the little ship to do her best; then Kendrick, stowing his bundle under the deck, stepped in and paddled off

into the darkness, now quite at home with this mode of locomotion, and in a moment was lost to view. In a few minutes he came alongside the scout cruiser, at the foot of a ladder hanging over the ship's side, where he was met by an officer. No enlisted men were in sight, for it had been arranged by this officer that none should be where they could witness the arrival of this peculiar-looking craft. The officer lowered a rope which Kendrick secured around the kayak before coming up the ladder. These two then hoisted her on board and stowed her in a prearranged hiding-place. A few minutes later the cruiser let go her mooring and slipped out through the gate in the net, which was opened as she approached, and closed at once behind her.

It was now early in December and the long nights afforded the cruiser the cover of darkness during most of her journey. All night and all day, and the next night till after midnight she steamed eastward. At two in the morning she stopped about two hundred and fifty miles from Cape Trafalgar. With none but those needed for the work to witness the proceeding, the kayak was removed from her hiding-place and lashed to the seaplane in such a manner that she could easily be cast loose when the seaplane had alighted on the water. Kendrick took his place in the plane, followed by the pilot and mechanician, and in a moment they shot out into the air, the engine roaring in their ears.

The first red streak of dawn was showing over the eastern horizon when the seaplane hovered and came down on the calm surface of the sea, trailing a white streak of spray for a moment, then coming to rest. Fifteen miles away lay the Spanish coast. Losing no time, Kendrick cut loose the kayak from her lashings, climbed in, waved good-bye and paddled off into the northeast, keeping the light of the

dawn on his starboard beam. The seaplane rose and flew away, and in less than three hours was hoisted aboard the cruiser, which headed for Punta Delgada, and not ten of all her complement of officers and men had even a vague idea of the purpose for which their excursion had been made.

Kendrick had a compass by which to steer as soon as it was light. He wished to land in the twilight, and with ten hours at his disposal it was not necessary to paddle constantly to reach the shore before dark, so, without exerting himself, he was near enough the shore to study its character by the middle of the afternoon. Then he took it easy, waiting so far from shore that his tiny boat would scarcely be visible to the naked eye, and watching land, sea, and sky for observers who might detect his arrival. Then the sun set, and, choosing a lonely-looking spot, Kendrick paddled quickly in shore to avail himself of the fast-fading light in choosing a place to land. Through the line of white foam that fringed the shore he picked out a recess where the force of the waves appeared broken, dodged the outlying rocks, and soon, with a vast sense of relief, was dragging the kayak up on dry land. In the dark he studied the ground about him, and found a place to hide the kayak so completely that he could feel assured she would not be found, and thus give a dangerous clue to the enemy sleuths.

On shore in Spain, he was once more in a familiar environment, one that brought his extraordinary faculties into full play. With nothing but his wits and the small bundle of belongings he had brought under the deck of the kayak, he launched himself on the enterprise of getting into Gibraltar unnoticed, and making himself desired as a radio operator and trusted in that capacity. How he overcame the innumerable and formidable obstacles to such a course

would require a volume in itself. But that is another story, and we must return to Punta Delgada.

After a week had elapsed, Evans began listening every day at the appointed hours to see if the enemy traffic showed any signs of Kendrick's magic touch. The excuse of testing his new device had to be worked for all it was worth, until one operator remarked to another, after he had gone, "He's tested it every way he can; he seems to be so pleased with it he just wants to listen in even if there's nothing in particular to pick up."

Three weeks elapsed during which Evans and Barton met now and then and speculated over Kendrick's probable fortunes and the prospect of hearing from him. At last, late one afternoon as Evans was listening in, he picked up a pencil and began writing on a slip of paper; slowly he wrote, only five or six words a minute instead of the usual twenty to twenty-five at which messages are received. For nearly five minutes he wrote, then stopped, and, after listening a moment more, he took off the head-phones and slipped out of the radio room. Taking the first boat ashore he hastened to Commander Barton.

"What's the news?" asked Barton eagerly, as Evans entered his office.

"He's there. Got an operator's job that gives him access to a good transmitter," answered Evans; and he pulled out of his pocket the slip of paper with Kendrick's message and handed it to Barton.

"That's real business," said Barton with unrestrained joy, on reading the message. A long conference ensued in which Barton and Evans reviewed the possibilities opened by this new channel of communication with Herringham in Constantinople, and laid their plans for making the most of it.

CHAPTER IX

THE ROUND-UP

AN earlier chapter has told of the planning of a fleet of net-laying ships to coöperate with chasers on their drifting patrols and to surround at short notice a designated spot where a submarine had been located with hydrophones. This fleet of ships, eight in number, completed at last, arrived at Punta Delgada about the first of December. In accordance with their instructions, they commenced practicing the maneuver of proceeding at speed to a spot designated by signal from a destroyer or chaser and then surrounding it in such a way as to enable them with a minimum of lost motion to lay their lines of nets completely around the spot at a specified radius from it. This maneuver required a high order of team-work and a correspondingly large amount of drill; after a few weeks of this, however, the personnel acquired enough proficiency to make the officers feel ready to carry it out in earnest, and they grew impatient to try it on a real submarine instead of an imaginary one.

Then they began to go out as planned surrounded at a distance by groups of chasers on drifting patrols. But the ocean is very large, and the days and weeks seemed long as they waited for their first chance to put this new method of hunting to the test of a real "fix." The skippers of these ships began to complain that their time was wasted — not to mention the elaborate equipment — when the chance of picking up a scent seemed so remote. Yet enemy submarines were abroad, as was shown by the toll of merchant

ships, sunk in spite of the best efforts to lead them in organized convoys through to safety. An unfortunate atmosphere of grumbling at being tied up in what appeared to be an elaborate failure began to develop and to spread from the net-laying fleet to Headquarters. Was this vast project to prove a waste of effort and a failure, after all?

The enemy was gradually increasing the efficiency with which he planned and executed his submarine forays. The principal secret of this lay in the concentration of his submarine forces. Groups of five, six, or seven submarines would await a favorable moment in the conditions of ocean traffic; then proceeding together, combining their resources in the matter of detecting the approach of hostile craft, and skillfully disposing their force, they would deliver a concerted attack on a convoy, and often would take a heavy toll of tonnage.

Aided now by the acquisition of the code book brought from Washington by Bela, they prepared to launch more formidable attacks than heretofore, knowing in advance the disposition of Allied ships, and thus able to choose the most vulnerable point. It was necessary first to ascertain, if possible, whether the code was actually in use as planned. Possibly the book had been missed, and the Yankees had decided to abandon the code for fear it had fallen into enemy hands. To this end all the intercepted radio traffic of the Allies was diligently copied, and every effort made to correlate it with observed movements of Allied forces by sea or air. To the great delight of the Turks, they found messages being sent which conveyed a meaning when decoded in accordance with the system set forth in the book.

Early in January there came a welcome opportunity to verify the code and to satisfy the Turkish Chief of Staff that it was indeed being used by the Allies for directing

naval operations. Punta Delgada was heard sending messages which when decoded proved to be addressed to a ship carrying seaplanes headed toward the Portuguese coast. These messages related to a bombing attack on the defenses of Lisbon. Eagerly the Intelligence officers at this port followed the preparations and then the progress of the attack. The seaplane carrier was next heard sending messages to the planes in the air, messages which were readily interpreted by means of the code, and finally, at the time when these dispatches had led them to expect it, the seaplanes appeared, only to be driven off by an overwhelming force of small fighting planes which, thanks to the code, had been prepared in time to prevent a single bombing plane from reaching its objective. The Intelligence officers were greatly elated, and praised the name of Bela.

About a week after this incident, a force of seven submarines set forth from Gibraltar to make a series of destructive attacks on Allied shipping. It was to be a long cruise, and no pains had been spared to equip the submarines with all the munitions they could carry to do their job well, for this was the first time a large group had gone out since the new code had become available to the skippers.

When two days out from Gibraltar, the radio operator on watch in one of the submarines began picking up signals from Allied ships. Word was passed to the others, and all listened intently. The messages were copied and decoded with the key in the stolen book.

The following situation was deciphered: A large and important convoy from Brazil was approaching the danger zone; it had reached its supposed rendezvous and found no escort; no ships responded to its low-powered radio call. Now it was calling Punta Delgada asking for instructions, evidently using just enough power to reach the Naval

Headquarters, and incidently the submarines, but endeavoring not to use enough power to be heard in Spain or Portugal. From the exchange of messages it appeared that an earlier dispatch, which should have led to the sending of a destroyer escort, had failed to get through. Owing to this misunderstanding, then, a valuable convoy was already entering the danger zone, and no escort was available for its protection. Punta Delgada was finally heard to instruct the convoy to proceed at maximum speed on a zigzag course and to refrain from using radio; at the moment no destroyers or cruisers were available, but, if possible, an escort would be assembled on the following day and sent to make contact with the convoy farther on.

The submarines were proceeding in a westerly direction, spread out in a long scouting line extending from north to south. With their radio direction-finding apparatus they took bearings on the flagship of the convoy as she sent her messages to Punta Delgada. To their unbounded delight, the position which this indicated corresponded closely with that mentioned by the convoy flagship in her dispatch to Punta Delgada, a point about three hundred miles south of the eastern Azores. Once more the stolen code had proved itself correct.

The intercepted dispatches had revealed what the course of the convoy would be during the next twenty-four hours. So the submarines shaped their own course for the place where they should find their victims the next morning soon after daybreak. Eagerly the officers of the flagship bent to the task of preparing their formation for the attack.

"Bela has served the cause well," said the Captain; "his reward for this will be great." And warm was the praise of him echoed in the rejoinders of the others.

As the gray afternoon wore on, the seven long, sinister-

looking ships glided steadily westward, their low decks washed by the waves, and only the conning tower of each visible from her next in line. By dawn next day they should be already in the path of the northbound convoy, in plenty of time to re-form on a line stretching east and west which would surely cover the course of their intended victims and thus ensure good prizes for at least one and probably more of the submarines.

As the gray twilight settled down on the sea, the line closed in till not more than three miles separated the ships at the extreme ends. Every valve, every item of machinery and armament was carefully inspected and all necessary tests were made, that no mishap should hinder the reaping of the grim harvest on the morrow. Tense as were the nerves of all, those off duty slept during the night, for a submarine crew must learn the art of sleeping when the chance offers. The captains scarcely slept at all, but, as each new watch went on duty, exhorted the radio operators and hydrophone listeners, going to their posts in the hull, to listen as never before. From ship to ship such messages as occasion required were transmitted by radio phone, with barely enough power to cover the distance intervening between them. Once soon after midnight the seven ships stopped to listen in silence, in case the convoy should be approaching sooner than was expected, but, although lying still in the water increased the range of the hydrophones by many miles, not a sound was heard.

Two o'clock came, then three. The tension of eager anticipation grew. With powerful night glasses, the captains swept the sea, but nothing appeared to break the leaden skyline. At four o'clock they stopped again to listen, but through the hydrophones the ocean seemed as still as the grave. Soon they would be in the path of the convoy, and,

taking their stations, would stop and wait. But they had twenty-five miles yet to go and two hours more of darkness. Westward with decks awash they steamed at fourteen knots.

At half-past five nothing had broken the monotonous suspense. Then suddenly a report was flashed in by radio from the submarine at the northern end of the line — the hydrophones had detected a ship bearing northwest. This was an unexpected quarter. Was it the convoy or something else? Scarcely had this report been received when it was followed by another — the sound was increasing fast; there seemed to be more than one ship, approaching at high speed. Another of the submarines had heard the sounds also, and then another, till in a few minutes they were heard all along the line. What was it? The captains began to be uneasy. The ships were approaching much too fast to be the convoy; besides, they didn't sound like merchant ships, nor did they sound quite like destroyers, nor yet like cruisers. One fact soon stood out above all others; their bearing did not change; whatever these ships were they were coming toward the submarines as straight as if steering for a lighthouse at their home port. Uneasiness changed to grave apprehension. Nearer still they came; the oncoming ships could not now be more than six miles from the nearest of the submarines, judging from their rate of approach.

A red streak of dawn showed faintly on the eastern horizon. There was one thing to be done, and that without delay — submerge. Quickly the orders were given, hatches were closed, valves opened, electric motors started, and the seven ships sank beneath the waves, leaving only the periscopes to observe the approach of the enigmatic ships. Nearer the sounds approached, and then the bearings be-

came confused; the ships seemed to be spreading out in a wide arc from north to west. Then dimly through the periscopes the dark forms of long, narrow ships could be seen in the faint dawn light. Two by two they came till at last the submarine skippers counted eight. Two pairs started to cross the bows of the submarines to the west and southwest, while the other two pairs deployed to the northeast. Just what kind of ships these were could not be made out, but at all events their speed marked them as warships of some sort. The greatest safety lay in concealment and silence; the submarines, therefore, slowed their motors till they had barely steerageway; and as the light increased and the strange vessels drew nearer, the periscopes were withdrawn, and the submarines dived deeper. But before the last periscope was withdrawn below the waves, a fleeting sweep of the horizon was made which revealed the two ships to the west executing a peculiar maneuver. The leading ship of the two doubled on her course and, passing very close to her partner ship, started steaming at reduced speed in the opposite direction, while the ship which had followed her also reduced speed, but held her course. One thing more was revealed by this final sweep of the horizon — a destroyer in the wake of the other ships approached at high speed from the northwest.

On the bridge of this destroyer, besides her skipper and others on watch, stood Captain Fraser, chief of staff to Admiral Johnson, Commander Barton, of the Intelligence Bureau, and Evans. The eight ships seen by the submarines were the new net-laying squadron. Not a conning tower nor a periscope had they seen, but nevertheless they were now paying out their nets in a circle seven miles in diameter. Each pair laid a quadrant of the circle, the two starting at a point and steaming opposite ways till they met the ships of

the adjacent quadrants, and thus completed the circle. On each of the eight ships the strange new mechanical gear was working at top speed, drawing the great net from the hold of the ship and paying it out over the stern, the supporting buoys and the little indicator bombs splashing ceaselessly into the water, while the crew tending the gear worked with all their might.

And now, following a few miles behind the destroyer carrying Captain Fraser, came eleven more destroyers steaming up at thirty-five knots out of the western haze. Following the lead of the first destroyer, the other eleven started steaming in a steady procession round and round the outer edge of the circle of nets. Then as the dawn merged into daylight there appeared from several points of the compass small gray chasers, hurrying to the scene of action, and finally from the northwest, more chasers, swarms of them, till the sea was alive with the little craft.

The first of the chasers to appear on the scene, some eighteen in number, coming from all directions, had been lying all night on a drifting patrol stretched in a long line from north to south across the path of the submarines. So near had each chaser been to the next in line that word could be passed from one end of the line to the other without the use of radio, by simply flashing the signals from boat to boat with infra-red rays, invisible to the eye, but readily perceived with the selenium detector. At a point near the northern end of the line, some fifteen miles from the present busy scene of action, the net-layers had lain in wait, together with the twelve destroyers, on one of which was Captain Fraser in charge of the operation. He had brought with him Commander Barton to observe results, and Evans to supervise the use of the infra-red signaling apparatus,

lest through some failure of this unusual method a chaser captain should be impelled to use his radio and thus reveal his presence to the enemy.

Now, just before sunrise, while the eighteen chasers of the drifting patrol were taking station, as fast as they arrived, in groups of two and three just outside the eight openings where the individual nets met and overlapped, the other chasers which had come from the northwest filed in through one of these openings, one at a time, each rounding the net-laying ship as she lay holding the end of her net, turning and threading with an S-shaped course the narrow gap till within the enclosed area. When all had entered, they formed in two long parallel lines at right angles with the net on the northwest side, those in the front line spaced within a stone's throw of each other, those in the second line, nearly half a mile behind, being somewhat more spread out. As soon as the lines had thus formed, buoys were thrown overboard to mark the beginning of the sweep; then each chaser in the front line dropped over her stern two paravanes or submarine kites to be towed astern at the greatest depth to which a submarine could go, one from each quarter, each equipped with a small contact mine like those in the net. At a signal from the chaser flagship, all started, jumping to their full speed, following the curve of the net in line abreast, and the sweep began.

The destroyer, with Captain Fraser on the bridge, stopped in her tour of the net, close to the point where the chasers assembled, and the officers on the bridge stood watching the maneuver.

"They're off!" cried Fraser as the chasers started their sweep. "Over the line like a bunch of colts on a race-track. Go it, boys!" and he rang, "One third speed" on both engines to keep the destroyer abreast of the sweep, exclaim-

ing, "I hope we've got the whole works inside this purse-string."

"It's bad business if we haven't," remarked Evans. "It must be '*spurlos versenkt*,' or our talisman will lose its charm."

"You're right there," echoed Barton warmly. "'*Spurlos versenkt*,' no matter what the cost."

"How many do you expect there are, sir?" asked the skipper of the destroyer, addressing Captain Fraser.

"According to Commander Barton's friend, seven started out together from Gibraltar. They have probably stayed together," answered Fraser. Then, seeing Barton look uneasily at the quartermasters on duty on the bridge to see if any had been within hearing, Fraser added, "Keep that about Barton's friend under your hat."

"What assurance have you that they are all inside the net, sir?" asked the skipper.

"We had a series of clear fixes from four of the chasers," answered Fraser. "At the last fix their motors were heard to slow down. That was — how long, Evans, before we started laying the net?"

"Twenty minutes," answered Evans.

"Twenty minutes," resumed Fraser, "and in another twenty-five the nets were laid. The last fix was at the center of this circle; their speed from that point could not have averaged more than three and a half knots without their being heard, in spite of the noise of our engines. That gives them two and a half miles; the nets are three and a half miles from the fix. That's a margin of a mile; pretty safe, I think, considering the accuracy of the fix."

All eyes were on the chasers. Ten minutes passed; it seemed an age. Then at last a small fountain of water rose in the wake of one of them. A paravane had struck some-

thing under water, and its bomb had detonated. Instantly from the second line of chasers the three most nearly behind the explosion converged upon the spot and smothered the vicinity with a concentrated barrage of depth charges. Mid the jar and din and the monstrous fountains of white and black froth there rose bits of wreckage, clearly visible to the watching eyes on the destroyer. The chaser whose paravane had given the signal kept her place in the line; another paravane was thrown out astern to replace the first which had done its duty and gone; and the sweep went on.

Fifteen minutes elapsed. Then two miles away another small fountain rose into the air, this time from the encircling net. The two nearest destroyers raced to the spot and laid down a pattern of depth charges which ripped to bits a hundred yards of the net, and brought up other wreckage which told of another kill. The drifting chasers on that side of the net, hastened to the spot, and with grappling irons caught the broken ends of the net and drew them together, securing them with a short overlap. Meanwhile a maneuver had been commenced by the net-laying ships and chasers together, whereby the ends of the net were slowly drawn in toward the center of the circle, in order to reduce the area to be swept.

More telltale bombs behind the chasers sent up their signal fountains, and two more barrages brought up their gruesome wreckage. The ocean shook and seethed with the tumult.

"It's a grim business," muttered Evans, looking on solemnly. Never before had he stood by in cold blood and watched such a horror of war being enacted. The thought of the helpless wretches under the water being systematically hunted down and blown to eternity, oppressed his spirit, and made him graver than was his wont.

Terrified by the appalling din of the depth charge barrages, one of the submarines came at last to the surface and surrendered. The crew were taken off by a chaser, but before leaving, they placed a demolition charge where it blew open the hull of the submarine after they were safely away, and sent her to the bottom of the sea.

"By Jove, those are risky captives to have," said Evans, roused from his depression by this new turn of events. "Better put 'em under lock and key where they can't get ashore."

"That's no idle jest," said Barton. "Captain Fraser, I'd keep those prisoners on one of the ships in this action, if I were you, and not let a soul who hasn't been here see or hear of them."

"That won't be easy to arrange," said Fraser. "But you're right; we can't afford to take the risk of letting them get ashore."

Some minutes passed in silence.

The sweep had now gone from the northwest through the southwest to the southeast side of the circle. Then another bomb went off, and another heavy barrage racked the sea and sent up tokens of destruction. The count stood six. The officers were standing together in a small group at one end of the destroyer's bridge, at a safe distance from the ears of the quartermasters.

"Too bad your friend Wellman isn't here to see the fun," said Barton to Evans with a dry smile.

"Who's Wellman?" asked the skipper of the destroyer.

"A special messenger we sent to Constantinople with a code, so they could follow our instructions when we told 'em what to do."

"You sent?" exclaimed the skipper. "How do you mean 'sent'?"

"Well, he didn't know he was being sent," said Barton. "He thought he was turning a rather good trick; and he was — for us. He was hanging round Washington in a way we didn't like; so, when we'd seen enough of him, we gave him a little present, and he toddled off to hand it over to his boss."

"So that was the game, was it?" said the skipper with a chuckle.

"Yes," answered Barton, "but keep it right under your hat."

"I'm a good deal scared that he'll hear of the sequel to his stroke of genius," remarked Evans.

"That mustn't be," rejoined Barton firmly.

The sweep of the chasers went on till the circuit of the net had been completed. But since in the close formation necessary for a thorough sweep the chasers covered barely a mile, there was still an inner circle of two and a half miles' radius that had not been swept. Assuming that the original seven submarines which Kendrick reported to have left Gibraltar had kept together, there was still one in the area to be found. Five had evidently held more or less to their course and had reached the western side of the netted area in time to be caught in the sweep; the sixth, turning to the southeastward away from the approaching fleet, had been caught on that side. The seventh, assuming she had stayed with the others, was still in the ring, and remained to be found.

Swinging in toward the center of the circle, the chasers began their second circuit of the enclosed area, this time so placing the line that it overlapped slightly the area of its previous sweep. It might be a prolonged search, for each time the circuit was made, the submarine might shift into the area just swept, and thus escape. Still, in her blind

state of submersion she could hardly dodge them in definitely; and ultimately the drawing-in of the net would so limit the area that the chasers could rake it in a single sweep.

The morning wore away, and the circles successively swept by the chasers closed in on the center, toward which also the ends of the net were towed, and, as the circumference of the circle became shorter, the superfluous lengths of net were recovered from the water and stowed in the holds of the net-layers.

It was nearly noon; the entire area had been swept by the chasers and their weary officers had begun to think there could be no more submarines. The chaser flagship made signal requesting instructions. Fraser signaled back from the destroyer to renew the sweep, designating a course which, in view of the altered size and shape of the area, would offer the best prospect of finding an object thus far missed. The sweep went on. The chaser skippers were wondering how much longer the raking process, already becoming tedious, would have to continue, when another detonation of a paravane bomb gave the signal for attack. Again the following chasers charged the spot, and again a formidable array of depth charges shook the sea and sky; and visible wreckage brought the count to seven.

"That makes the whole works, sir," said the destroyer skipper to Fraser.

"Yes," answered he, "but we're going to keep on sweeping for a while. We can't take any chances of any of them getting back to tell the tale. It isn't likely, but there's just a small chance that some of them, even with visible wreckage blown off, might not be too much damaged to get home. Then, too, an eighth sub might have joined them after they left Gib."

And so the sweep went on. And at last, early in the afternoon, the nets had been drawn in till there was less than a square mile enclosed. Then it was that the chasers were able to sweep the entire area at a single stroke, their line stretching clear across it. Three times they swept it thus, but nothing more did they find. Then the sweeping ceased, and in single file the chasers left the enclosure. Still the nets were towed closer together as they were being reeled in aboard the ships, and finally they were brought together in pairs till there was no room left for a submarine to lie between them. Then only did Fraser signal that the hunt was over and the fleet would return to its base.

"Evans," he said, "your radio-compass men, both at Saint Michael's and Madeira, did a good job in spotting these subs so soon after they left Gib."

"Yes," said Barton; "that helped a lot; it gave us a good start. Still, the trump card was the code. By the way, Captain, don't forget to send the escort out to meet that convoy just as soon as you can spare it."

Fraser laughed.

"Well," he said, "I think we all rate a good rest after this."

As the procession headed for Punta Delgada, the tired officers sought their bunks, all that could be spared from the duties of the watch. For many hours the nervous tension had been unremitting. A sense of triumph pervaded the flotilla, which combined with fatigue made for easy relaxation. But in Evans, underlying this feeling was a sense of oppression due to the horror of the submarine carnage. Added to this there lurked the fear that the story of the trap might reach the enemy and rob his magic talisman of its power to do, possibly, even greater things in the future.

No more doubts were raised as to the utility of the net-

layers. The eagerness of all concerned to be out again in search of more submarines was rather inclined to go beyond the dictates of good judgment. For it was not every night that a line of drifters could hope to intercept another such group. At all events, the enthusiasm bred of the adventure was a wholesome tonic, and on every hand the energies of officers and men were bent to the task of bringing about other successful hunts.

Meanwhile Evans devoted his energies to exercising a tireless surveillance over the radio stations in the islands. Wherever there was a transmitter he found an excuse to go and tinker with the apparatus, apparently too much absorbed in the wiring to notice the operators or their handling of the traffic; in reality, looking for any indication that might mean leakage of information to the enemy. Commander Barton installed secret agents at every station from which messages could go out, camouflaged as "strikers" or "makee-learn" operators, and these were charged with the duty of watching with eternal vigilance for evidence of suspicious messages.

In its effect on tonnage losses the result of the submarine round-up was appreciable. Seven fast, seagoing submarines, gone at one stroke, meant a substantial loss to the enemy, and a corresponding saving of Allied shipping could be detected. Yet still the situation was critical. More submarines were building, and, unless more round-ups could be brought about, the outlook for the future was none too bright.

The increased vigilance of the listening crews on the drifting chasers brought its reward in other round-ups in which several ocean-going submarines met their doom. And in greater security the endless convoys carried their cargoes of munitions into Northern Europe.

CHAPTER X

THE POWER OF SUGGESTION

As the winter wore away, great troop convoys poured a seemingly endless stream of American soldiers into Northern Europe to reinforce the armies there, worn as they were with their ceaseless vigil, holding the line, but never able to push the enemy back. It was indeed a deadlock; and all the world watched in suspense. At times it was worse than a deadlock. Murad Pasha, the Turkish generalissimo, was a military genius. He kept harassing the northern lines with masterly strokes of surprise action which told heavily on the more heterogeneous, less consolidated Army of the North. The length and breadth of North America every one was "doing his bit." All industries were mobilized for war. The women knitted socks at home or worked on farms and in factories. All watched the daily press, noting with alarm each move of Murad; eagerly grasping at hope when a colossal bombardment forced the Southern Army back ever so little. On that battle-line all thoughts were focused and all hopes were based. The navy, shielded from the daily press by two thousand miles of silent ocean, was little heeded as compared with the army. Its doings were almost unknown to the general public.

At the Azores little change of consequence occurred in the naval situation. By diligent application of the methods thus far developed, enemy submarines were from time to time found and either destroyed or damaged, but, although the menace was diminished, it was always there, and the toll of merchant and supply ships continued to be heavy.

The fleet was kept in fighting trim by constant drill, and those in command were eager for a decisive action with the main fleet of the enemy. The outcome of such an action could not be foretold with any confidence, for the fleets were very evenly matched. Still, with the condition of hopeless stalemate existing in the absence of such an action, with the fear of a master stroke on land by the resourceful enemy, the men of fighting blood were ready to risk the supreme test. The enemy, however, was carefully holding his main fleet within the Mediterranean. Was there any way to draw him out? The British and American admirals speculated much concerning his disposition to engage in a major action if conditions should appear favorable. What apparent advantages, they wondered, would suffice to make him risk a meeting with the Allied fleet?

Evans, from time to time, went into the main transmitting station on shore to "test the apparatus," and on these occasions, after making certain adjustments, would sit down with his hand on the key and send out a few seemingly meaningless dots and dashes. Whereupon Kendrick at Gibraltar would copy down a message and pass it on to Heringham in Constantinople. Also from time to time Evans, testing the receiver on the flagship, would at certain times of day write things down on a slip of paper in a leisurely manner — only five or six words a minute. After he had done this, he was apt to have a talk with Barton.

On one of his visits to the transmitting station he sent a request for information on the moot question — how did the enemy look on the possibility of an encounter with the Allied fleet? Would a slight apparent advantage in weather conditions suffice to draw him out, or must the Turkish Admiral see a chance of cutting off a small detachment of Allied ships before leaving his base? A few days later, after

Evans had talked with Barton, Barton talked with Fraser, chief of staff, and Fraser talked with Admiral Johnson. It seemed, so Fraser told the Admiral, that Barton had secured advices through secret channels that the enemy's attitude toward a possible naval action was decidedly conservative. If he had reason to suppose he could catch the Allied fleet unprepared, with weather conditions which would put the advantage of visibility on his side, he would risk action; otherwise he would hold his fleet behind the defenses of Gibraltar until he could catch a detachment of the Allied fleet far enough from support to warrant the hope of cutting it off and destroying it.

Each month at the date set in the key to Bela's code book for the change of code, the Intelligence officers of the enemy noted with satisfaction that a considerable part of the Allied radio traffic made sense in the new code. The rest of the traffic, they concluded, was probably nothing but dummy messages sent to disguise the times of increased volume which would otherwise give evidence of naval activity, a well-recognized practice. The loss of the seven submarines was still a complete mystery, and as their commander had had no opportunity of reporting back to headquarters any of the messages they had heard concerning the mythical convoy, nothing had yet transpired to arouse any suspicion about the code.

At Punta Delgada the prisoners taken in the great round-up were carefully guarded on a ship of the fleet, never allowed on shore, and only seen by one or two trusted persons who took them their food. No one save Admiral Johnson, the four officers who had stood on the bridge of the destroyer during the round-up, and two or three others at Headquarters, knew how the submarines had been lured to their destruction. All others simply supposed they had

first been located by radio compass, and then more exactly by the hydrophones of the drifting chasers; and incidentally both of these facts were true.

One day late in February, Fraser was in the radio room of the flagship discussing with Evans the intricate system of radio communication by which her many diverse duties as the brain of the fleet could be performed in battle without mutual interference. The discussion was profitable to both, for though a chief of staff cannot afford to encumber his mind with an excess of technical details, nevertheless a clear understanding of the principles on which the directing mind coördinates the moving parts of a fleet is useful to all concerned. It was the way in which principles were applied, rather than minute details, with which this discussion dealt. Fraser desired to prolong the conversation to a greater length than was feasible in the radio room; so at last he said, "Let's go ashore and talk over these things where there isn't so much going on."

"I can show you a quiet spot where nobody goes," answered Evans.

Together they went ashore and Evans led the way to the Borge garden. The old gardener opened the gate, and the two men entered and strolled off among the great tree-ferns and other rare plants. Fraser was enchanted. He had never even heard of the place before. As they explored the deep grottoes, he exclaimed with delight at the vistas of rich and varied greenery. Finally their walk led them to the old watch-tower at the top of the garden where they sat down and, looking out under the branches of the old cedar toward the ocean, continued to discuss communications and their relation to tactics. The little birds, accustomed to a feast whenever Evans came to the garden, now gathered round him and hopped on the ground search-



FRASER SCRATCHED ON THE GROUND DIAGRAMS ILLUSTRATIVE
OF THE FORMATIONS HE HAD IN MIND

ing for the usual crumbs in vain, for to-day he was too much occupied to recall what was expected of him.

Evans, questioning Fraser about major naval actions, drew from him an expression of his views on the most important elements of success. Among these Fraser placed great emphasis on surprise. From this the conversation went on to a discussion of the pros and cons of various possible fleet formations, in which Evans questioned and listened attentively. With a sharp stick Fraser scratched on the ground diagrams illustrative of the formations he had in mind. A few leading questions made him warm to his theme and crystallize certain ideas on tactics hitherto latent in his mind. And as he disposed the great units of the mighty Allied fleet on the wide expanse of the sea, he kept reaching the point where his hands were tied by the limits of visibility; in his tactics the units must be within sight of each other to be operated accurately as coördinated parts of an organized whole. This limitation restricted him, and he mentioned it specifically as obstructing certain expansions in tactical arrangement at which Evans had hinted.

"Suppose you could find a way to overcome that limitation, and place the divisions of the fleet in their desired relative positions beyond the range of visibility, what use could you make of it; that is, what effective formations might you then adopt?" asked Evans.

"Well," said Fraser, "that might open lots of possibilities. But how could you ever place your divisions accurately at distances beyond the limits of vision?"

"If you wanted to badly enough, you could place and maintain *any* unit in the fleet in *any* desired relation to any other by triangulation from radio-compass bearings."

"That's an idea," said Fraser. "But, then, your units

would have to keep sending radio signals, and the enemy could locate them with *their* radio compasses; so that you'd lose all the advantages of surprise, and that would cut out most of what you might gain by that sort of trick."

"Only one unit need reveal its position by sending radio; the rest can take bearings on the signals of the key unit, and thus take station without ever making a sound."

"That's so," said Fraser. "That opens some very interesting possibilities."

He thought a while, and scratched more diagrams on the ground, developing a few applications of this method. Evans discussed and questioned and led him on. The wax was now plastic in his hands. With acute suspense he watched Fraser's mind work. Had he made the premises suggestive enough, and would the main idea strike home? A false step now might forever block the path to success. But what was this preposterous thing he was doing? A vista opened before his mind's eye revealing vast armies stretching in unbroken line for hundreds of miles across the continent of Europe while the whole world watched in agonized suspense, and the colossal industries of the Western Hemisphere, working feverishly, poured their great stream of food and supplies across the ocean; and there on the placid sea before him lay the great fleet, the keystone of an arch that spanned the world. And he, a gunner, was seeking to sway the mind of the chief of staff of that fleet. For a moment he felt weak and foolish in his impudence. But then again he saw the picture in a larger perspective, and all that was at stake spurred him on. The wax was indeed plastic in his hands; a leading question, a veiled hint, and he saw Fraser's mind working toward the scheme he had outlined to Mortimer in the autumn. As the plan evolved and took shape in the rough diagrams he was

scratching on the ground, Fraser's enthusiasm grew till he was as keen as a schoolboy learning a new game. Then he brought himself back to earth and said:

"The trouble is, to get away with it, you'd have to have the enemy in just the right place, and then if the wind was wrong you'd lose most of your advantage through the wrong kind of visibility."

"We got the enemy, or part of him, just about where we wanted him last month," said Evans.

"In the submarine round-up," said Fraser. "That's so."

"There may still be possibilities in the same general technique," continued Evans. "As for weather, Commander Jeremy can tell us a surprising amount about what the wind and visibility are going to be like for several days ahead. Did you ever talk with him about that?"

"No," said Fraser. "I had an idea that the weather-prophet business beyond twelve to eighteen hours was still pretty much guesswork. And, anyway, be you ever so wise you can't control the weather."

"No, but you can choose it," said Evans. "You'd find it worth while to talk with Jeremy. He has really done some remarkable work, and I believe he could help you a good deal."

Fraser thought a moment.

"But to get back to your placing battleship divisions by radio compass," he said at last; "don't you think it would be too complicated and uncertain to rely on in all the stress of a naval action?"

"Not if it's worth doing," answered Evans. "It's no more complicated or difficult than director firing or torpedo work or several other things you rely on in battle, that have been perfected by intensive effort and labor. It's just a matter of insisting that the gear shall be in working

trim, and then everlastingly drilling the men in the use of it."

For a moment Fraser sat deep in thought while the other watched him. Then, as his face bespoke the conclusion of his train of thought, Evans added:

"The one thing I fear as a menace to the success of such a plan is treachery. Any little leakage of information bearing on it might well prove fatal. I should be afraid to have an intimation of the plan go even to the General Staff in Washington."

Fraser looked at him hard and nodded thoughtfully.

"Yes," he said, "a hint of it to the enemy would be fatal. But confidential messages to the General Staff are well safeguarded."

"Would any such message be necessary? I hate to think how easy it would be for a radio operator of the wrong kind to tip some one off by means of a cipher worked into the traffic; and you can't know all about every operator."

Fraser nodded.

"That's true," he said; "it'll pay to keep the lid on good and tight, if we try any game like this. But then, that's a big 'if.'"

During the next few days the ideas Fraser had arrived at during their talk recurred to him from time to time with increasing force, but with all his acumen he never knew the power of suggestion whereby the strategic plan which so fired his enthusiasm had been laid before his mind's eye. At last he discussed, with some of the admirals in command of divisions of the fleet, the question of training the personnel to place their divisions in long-range formations by means of radio-compass triangulation, and pointed out some of the tactical advantages that might be had by so doing. The admirals for the most part thought little of the idea. They

were used to thinking of the radio compass as a useful adjunct to navigation in thick weather, and as being possibly useful in finding enemy submarines, but to use it for fleet formations seemed ridiculous. Some thought it looked well on paper, but wouldn't work out in the practice; one or two simply didn't think. These officers, excellent men, well trained in their profession, could hardly be blamed for shying at so radical an innovation. An eminent scientist has said anent the inflexibility of the mind in the latter half of its career, that, considering what an immutable structure the nervous system becomes at maturity, the remarkable fact is that we can take in *any* new ideas after fifty. The flexible mind at this age is a rarity; the original mind at any age is a rarity.

Fraser sought Commander Jeremy and was surprised and impressed with the number of verified predictions of weather several days in advance and the regularity with which they were correctly made. The intricate system of measurements of temperature, humidity, wind direction and velocity presented a truly wonderful picture of scientific development; and the way all these were correlated with similar data from remote stations and the conclusions were reached was marvelous.

Fraser refrained from mentioning these matters to Admiral Johnson himself until he had noted the reaction of several of the rear admirals to his tactical scheme as he proposed it, and until he had given serious thought to their comments. Finally, having enlisted a moderate degree of approval on the part of two of these men, he suggested what he had in mind to Admiral Johnson. The Admiral, who valued Fraser for the efficiency he had already shown, listened attentively, but was disposed to shake his head at several features of the plan. It sounded to him too fantastic

and impracticable. Nevertheless, he consented to discuss it at a conference with his rear admirals.

The conference was called and Fraser went into it with the conviction that his proposal was fraught with momentous possibilities. But as the discussion progressed, he found that with only halting and hesitant support from the two admirals whose backing he had previously won, even his buoyant enthusiasm was no match for the opposition of the majority. But, since not one convincing argument against the scheme was presented by any one, he was at the end of the conference more convinced than ever of its essential soundness, and more determined to fight for its adoption. After the other admirals had dispersed, Fraser continued to discuss the matter with Admiral Johnson.

"You see, Fraser," said the Admiral, "you mustn't let your enthusiasm carry you away too far. The majority of the admirals were clearly opposed to your idea."

"Yes," answered Fraser, "but was there one single valid reason given why it should not work?"

"I don't know about that," answered the Admiral, "but it would be rash policy to adopt all of a sudden a new type of formation differing radically from that to which we are trained and which has been proved efficient, especially when a failure of this new-fangled method with which you propose to correlate the divisions would result in disastrous confusion and loss of all-important concentration of force."

"If we could hope to engage the enemy under tolerably favorable conditions," answered Fraser, "we should be justified in adhering to the present well-tried formations, but they know our strength and won't chance it. Unless we can draw them out by making them think conditions are favorable for them, they won't come out at all; and unless we have something up our sleeves better than they are

prepared for, we can't afford to risk action under conditions which they deem favorable. If things drag on as they are now, what does it mean? Continued deadlock on sea like the deadlock on land. At the present moment the deadlock on land is in danger of breaking for the worse. The enemy have recently made a serious breach in our line by a new trick in chemical warfare of which we have not the secret. There were enough reserves available to close up the breach this time. But with such methods, unknown to us, available to them, and with the marvelous generalship of Murad, and his genius for making effective use of just that sort of thing, the outlook for the war is very ominous unless we can force their hand at sea. It's worth everything to bring things to a head in the most advantageous way. If the stake is worth it, we can by adequate effort develop this method and make it work. Surely the stake is worth it."

The Admiral sat for a while frowning and tapping his desk with his fingers.

"What assurance have you that this method will work?" he asked at last. "Are you well enough acquainted with the technical difficulties that may have to be overcome to guarantee its success?"

"Technically it is the same method that has worked on destroyers in finding and sinking submarines. I have not an intimate knowledge of the technical details myself, but the radio gunner, Evans, who was responsible for its proper working on the first successful submarine hunt, knows more about it than any man in the navy; he has assured me that it would be perfectly feasible to apply the same method on the more extensive scale required for the maneuvers we've been discussing."

"It's risky to touch too closely on grand strategy in talking with a gunner," remarked the Admiral.

"I trust this man's discretion above that of most men of twice his rank," answered Fraser. "I have found his advice on technical radio matters of the greatest value, and he has an unusual sense of the fitness of such things from the tactical point of view. I wish you would talk with him about this; he could answer your questions as to the technical difficulties better than I can."

Admiral Johnson pondered the matter awhile and then decided to summon the rear admirals again and let Fraser call in Evans to explain to them more fully what radio direction-finding actually amounted to.

It was an atmosphere well calculated to make the stoutest heart quail that confronted Evans when Fraser brought him into the august gathering of rear admirals, their patience already visibly tried by the resumption of an apparently futile discussion. Admiral Johnson explained to him that his testimony was desired on certain technical questions concerning the radio compass. Carefully avoiding any disclosure of the ultimate object in view, he endeavored to outline the sort of service that might be required of the apparatus, and asked if it could be relied upon to perform this service accurately, regularly, and under a variety of adverse conditions. Evans with difficulty suppressed a smile as he listened to the Admiral's elaborate and guarded wording of the question he had come prepared to answer.

He answered emphatically and unqualifiedly in the affirmative. And he did not stop there. He went on to say:

"Technically the service you mention is no different from that which the radio compasses in cruisers, destroyers, chasers, and shore stations are performing daily. The apparatus would be used in the same way; it would simply be used for a different purpose."

One of the admirals asked if he thought it was well enough understood to be safely relied on in an emergency.

"Certainly," answered Evans; "it is as well understood as a gun, and that has been relied on in most of the emergencies in history."

"But isn't it the work of a highly trained specialist to keep it in proper working order and to use it accurately?"

"There again, I can say, without hesitation, not the least bit more so than a gun. It takes less skill to calibrate a radio compass than to bore-sight a gun, and it is far easier to use it accurately than to shoot straight with a gun; that is, with the accuracy required for practical results. If one quarter the effort that is spent bore-sighting guns and drilling gun crews were given to calibrating and inspecting radio compasses and training the men to use them quickly and accurately, and if the officers insisted on efficiency, the radio compass would do its job just as surely as the guns under a good gunnery officer. As for using the intelligence obtained with it, that is up to the officers that handle the fleet, and in that respect the Navy is not apt to fail."

Admiral Johnson was startled by the earnestness and assurance with which he warmed to the conclusion of his remarks; some of those present felt that he was verging on effrontery, and sought to snub him with expressions of doubt.

"Might I suggest," said Evans, turning to Admiral Johnson, "that the best way to settle this question and find out if the radio compass will do what you want, is to try it with the ships at sea in a test maneuver?"

One rear admiral, incensed by the gunner's evident contempt for the authority with which he had essayed to set him down, and the unabashed appeal to the higher authority of experiment, exclaimed testily:

"It would only be a waste of time, fuel, and energy."

"Would it involve any more time, fuel, and energy than the practice cruises which are being made periodically at the present time?" asked Evans quietly.

"On these we drill the men at battle stations, gunnery practice, and other things in which the fleet must be kept in constant training," said the rear admiral.

"That could all be done while the proposed trial maneuver is going on, without the slightest interference," said Evans. "The men at battle stations and the other regular drills needn't even know that any other test is being made; in fact, it would be better they shouldn't."

Another rear admiral who had been inclined to favor the plan from the first, now nodded in approval and remarked, "There's some merit in that idea."

Admiral Johnson then spoke.

"I can see no reason why the question should not be put to the test of a trial maneuver of the fleet, such as has been suggested. It is worth while to experiment to that extent and see what can be done."

He then requested Fraser to make plans for a maneuver which would give the proposed method of fleet coördination a fair test and to report to him the next day. Then turning to Evans he thanked him for his testimony, and, forgetting that Evans had just put the thought into his head by his last remark, warned him to be extremely discreet and repeat nothing of what he had heard to any one. Evans received the warning with due courtesy and deference, and then withdrew.

It was arranged that in a week's time two battleship divisions should take station on opposite sides, east and west, of a designated rectangular area at sea; then a division of cruisers, with the Commander-in-Chief on board, would

steam into this area from the south at a point unknown to the battleship divisions, and would continue on a roughly northerly course; the flagship in the lead and another ship at the rear, keeping a distance of just two miles between them, were to send radio signals to each other continuously. The battleship divisions, guided solely by their radio compasses, were to take station, each in a stated position, relative to the cruiser force, far enough away to be well out of sight, and were to maintain these relative positions without sending any radio signals; then at a given signal from the flagship they were to deploy toward her till visual contact should reveal whether or no the assigned relative positions had been accurately maintained. This was a fair test which should answer the question whether the maneuver Fraser had so earnestly advocated was feasible.

The next few days Evans spent going continuously from ship to ship inspecting and testing the radio compasses in all that were to participate in the maneuver, and satisfying himself that the operators were proficient in their use. The necessary testing of apparatus and quizzing of men took all his time from morning till night, and, as he sank into bed after the second day, dead tired, the feverish activity pursued him into his sleep. In his dreams he was still restlessly whirling the coils in a search of the elusive bearing — never quite satisfactorily obtained; or trying over and over again to drive into a stupid operator's mind an intangible something which he couldn't crystallize in his own. Ill refreshed by his sleep he rose and plunged into the task anew, questioning operators searchingly, drilling them when necessary, explaining to them points on which they were not clear. Before the week was over, he was able to rest with the assurance that the men would not fail him in this crucial test.

The ships put to sea, the two battleship divisions going first to their allotted places of waiting where with the usual drills the minds of all were kept occupied, none but the communication officers being apprised of the nature of the tests to be made. Admiral Johnson, flying his flag on a scout cruiser, then led the cruiser force into the designated area, laying a course that would put the direction-finding procedure to a real test. The visibility was low; barely two miles could a battleship be seen through the low-lying haze. The stream of radio traffic between the leading scout and the cruiser at the rear end of the line was begun and duly maintained. For thirty miles the column steamed northward after entering the designated area; twice they changed course, to render the task of the battleships more difficult. Then at last the signal was given for the battleships to deploy inward. When the forms of the battleships loomed up through the haze both east and west almost simultaneously, Admiral Johnson knew at once that they could not have been far from the positions assigned; and when their reports were all in and the laying-out of the day's work on the plotting-board revealed that each division had held its relative position to within half a mile throughout the maneuver, he knew that he had in truth a powerful weapon in his hand.

Immediately after this convincing demonstration, Admiral Johnson showed his worth by vigorously sweeping aside all objections on the part of the more conservative admirals and insisting that the new method of tactical co-ordination should be developed to a high degree of perfection; and in this he relied largely on Fraser. With the increased hope of gaining an advantage through surprise, the Admiral's eagerness for a decisive action increased, and he cudged his wits to think how this desired end could be

attained. Fraser, himself able to assimilate at a single meal the three ideas which had developed in his conversation with Evans, knew better than to feed them to Admiral Johnson more than one at a time. He now met the Admiral's desire to draw out the enemy by suggesting various ways of presenting an outlook that would appear favorable to the enemy Intelligence Service.

Frequent conferences followed between Fraser and Barton; and consultations with Jeremy on the weather problem. Conferences also occurred between Barton and Evans, unknown even to Fraser. The fleet engaged in an increasing number of practice cruises at sea on which they worked out various problems of group maneuvering by means of radio-compass triangulation, and yet all of the ships' companies except those directly concerned were kept busy at their own tasks, and remained in complete ignorance of this new feature of the fleet's activity.

As the month of March drew to a close, a subtle feeling diffused through the fleet that something of moment was in the air. In wardroom conversation remarks were dropped that vaguely reflected this quickening of the spirit of impending adventure. Yet no one could trace this feeling to its source. Was it, after all, anything more than the magic influence of spring which even to the worker within brick walls comes and permeates the core of his emotional being with a strange elation and a sense of universal expansion? Perhaps even in these semi-tropical islands, where there is little of the rotation of seasons as we know it in the North, the approach of April filled the men with a yearning that found its expression in this general sense that some great event was about to happen.

CHAPTER XI

INTRIGUE AND MISCHIEF

THROUGHOUT these days Evans maintained vigilant and nerve-racking watch over the personnel with a view to detecting any leakage of information by radio which might give the enemy a hint about the code. For more than one reason he now began to contemplate with increasing uneasiness the incumbency of Commander Rich as head of the Radio Division of the Bureau of Engineering in Washington. When Captain Brigham had told Commander White, the preceding August, about Commander Rich's advice to him on the subject of the radio equipment on the flagship, White had, of course, carefully refrained from repeating the remarks of his chief to Evans. But when in the autumn he was relieved by Commander Elkins, White had explained the situation to his successor and told him how Brigham's attitude had been responsible for virtually putting the most important part of the radio equipment out of commission. In the course of his explanation White had quoted Captain Brigham's remark about his conversation with Rich, which revealed the fact that this high official had actually encouraged the dismantling of apparatus whose value, though unknown to Brigham, was well understood by Elkins. In the course of the winter Elkins placed ever-increasing confidence in Evans as they worked together in the nerve center of the fleet. One day he told him of this remark of Captain Brigham's which White had passed on to him. Elkins mentioned it as evidence of ultra-conservatism in the Bureau, constituting a difficulty with which they were

obliged to reckon. To Evans it appeared not merely as a troublesome obstacle, but as a cause of grave uneasiness.

Another thing which enhanced this feeling was the fact that he had found several important pieces of radio apparatus, recently shipped from the navy test shop in Washington, seriously defective. What was more, the defects did not appear to be such as could be ascribed to sheer carelessness of workmanship; they were in vital parts of the apparatus, always where most difficult to discover, and most inaccessible and troublesome to remedy. The frequency with which these conditions were found was greater than could be laid to the common perversity of complex apparatus. Yet nothing of this sort had been definite enough to arouse in him much more than a vague sense of uneasiness, nor to make him feel justified in mentioning his fears to either Elkins or Barton. One night, as he lay in his berth pondering the significance of these defects which kept coming to light, there flashed on his mind the recollection that when last in Washington he had often seen Wellman going to see Commander Rich in his private office. At the time, this had not added much to his uneasiness about Rich, for, being already convinced that Wellman was a spy, it seemed only natural that he should be assiduously cultivating the head of the Radio Division; but now it began to haunt him. The malignant look he fancied he had seen in Rich's face came back to him. At the time, he had persuaded himself that it was a trick of his imagination provoked by pique. Now the memory of that look returned and would not be set aside. Late into the night he tossed on his mattress, devoured by ominous conjectures. When sleep came at last, the face of Rich, its malignity horribly intensified, haunted his dreams.

It was near the end of March; the preparations in the

fleet were daily assuming a more momentous import, and efficiency in the flagship's center of communication was more vital than ever. Radio Gunner Long now arrived at Punta Delgada from Washington, and presented himself aboard the flagship with orders from the Bureau of Engineering to make certain changes in the radio apparatus, changes which were the result of secret developments just made in the laboratories of the Bureau. Evans recalled having seen Long occasionally in the Bureau at Washington, though he had scarcely made his acquaintance. Now he received him with cordial attention, and asked him all the news from Washington, showing especial interest in the new developments which Long had come to introduce. In this he met a rebuff. Long answered his questions with generalities, evading any disclosure of the nature of the changes he was going to make. These were confidential, and his duty to the Bureau of Engineering constrained him from revealing their nature to any one.

It was nearing the noon hour when Long first began looking over the gear in the radio room in preparation for commencing alterations. Evans and the chief radio electrician were both in the radio room about their various duties, and offered to help Long at his task. He declined their offers; the job he was going to do was one that he could manage better by himself. He spent a good deal of time getting out pliers and other tools and looking them over; he stopped to examine this and that piece of apparatus, and altogether seemed to be very slow in getting to work. Eight-bells struck, and Evans asked Long if he wasn't coming down to lunch.

"I think I'll stay here and work," said Long. "I'm not very hungry to-day."

So Evans went to lunch, leaving Long alone in the radio

room except for the operator on watch. He had not been gone two minutes, however, before he returned to get a notebook he had left there. Entering quickly, he saw Long rise hastily from behind one of the receivers at the sound of the opening door, and on his face an ugly scowl gave way rapidly to a look of utter indifference. The place where Long was at work was so concealed from the operator on watch that it was impossible for him to see anything of the nature of the changes Long was making without leaving the receiver at which it was his duty to listen. Evans remarked something about forgetting his notebook, fumbled for a minute among the papers on the table, then left again and went to his lunch.

When next he returned, half an hour later, Long was in a different part of the radio room making some adjustments on the main transmitter, and took no notice at all of Evans as he entered.

Evans sat down unconcernedly and looked over some recent dispatches, then began to engage Long in conversation. A few platitudes were exchanged, and the atmosphere became a bit less tense. Evans began tinkering with some apparatus, and, opening a drawer, took out a strip of polished metal and set it down on the bench before him, propped against the panel of a receiver. Looking intently at the panel and with his back to Long, he asked in a casual voice, "What do you think of Commander Rich as an authority on radio?"

The reflection in the metal strip revealed a sudden start and a quick glance at Evans, but the voice was casual enough as Long replied, "Why, he's the greatest radio man we've got. Of course, I scarcely know him personally, but from all I've heard, I guess he heads the list, all right."

Evans continued to tinker with some odds and ends on

the bench in front of him and to examine the adjustments of the receiver, glancing now and then at the strip of metal. Long continued to kill time, fussing ineffectually over some wires. Evans then sat down comfortably in a chair with his feet up in another, and, taking his slide-rule out of his pocket, began to seek in it the answer to a mathematical riddle. He was determined not to leave the room now until Long had left it, and not then until he had done a bit of looking round. He made it evident that he was settling down to stay. But the slide-rule told him nothing more erudite than that two times two equals four; and even that bit of erudition was quite lost on him, for his thoughts were tussling with ugly conjectures.

An hour passed; Long kept as busy as he was able doing nothing, while Evans wielded his slide-rule, and once in a while scribbled a figure on a slip of paper. At last Long said, "Well, I guess I'll go to the machine shop and see if I can find some things I shall need to-morrow."

Evans took no notice of him as he went out, but, as soon as the sound of his steps had died away, he opened the door and looked out to be sure Long was not still lurking near by. Then shutting it again he hastened to examine the apparatus. He soon satisfied himself that the only changes Long had made in the main transmitter were trifling readjustments whose only effect would be to impair its efficiency a little without making enough trouble to attract the attention of the operators. Clearly that was not worth sending a man all the way from Washington to do. Evans then began examining the gear in the vicinity in which he had surprised Long when he first returned after his false departure for lunch. At first everything appeared to be wholly undisturbed. But on more careful examination he saw the tiny scratch of a screwdriver freshly made on the woodwork at

the back of a receiver not much used in port, but on which much would depend in communicating with the fleet in action. Seizing a screwdriver he hastily opened the receiver. Inside everything appeared as it should be; not a wire appeared displaced. But as he examined it more closely with a flashlight something caught his eye. Two wires had been removed from their terminals and then adjusted so that they rested in contact with them and would continue to do so as long as the receiver was not disturbed, but their position was so unstable that the jarring of the ship under way was certain to shake them loose and leave their ends dangling in the air. The result of this would be that as long as the ship remained in harbor the receiver would meet all tests without a flaw, but as soon as she put to sea this important means of receiving information from the fleet would be crippled.

The case against Long was proved as far as Evans was concerned, and he no longer had any doubts as to Commander Rich's complicity. He must see Barton at once. He looked at his watch and recalled that Fraser and Elkins had already gone ashore to meet Barton, and that in less than an hour these three were to start on a tour of inspection of the defenses on Saint Michael's, Santa Maria, and Formigas where were located the stations with the devices for detecting the approach of hostile craft to the outer line of nets. They would not return till late in the afternoon of the following day. It was just time for a boat with a liberty party to shove off for the shore; there would not be another for an hour, and that would be too late. He must catch that boat. He said to the operator on watch and the chief radio electrician who had just entered, "Keep your eyes open and notice the changes Mr. Long is making, as far as you can; it will make it easier for him to teach you any-

thing you will need to know about operating the set when he gets through."

Then leaving the room he ran for all he was worth till he came on deck, and, rushing to the starboard rail, looked over. There was the big motor-sailer already loaded with sailors and away, swinging round to her course for the inner harbor; in a minute she would be passing close to the ladder hanging from the boom off the quarter-deck.

Now every man aboard ship must ask permission to go ashore, and the officer of the deck is stationed at the gangway when the liberty parties leave, to grant such permission, but to a man performing such duties as Evans's, requiring frequent excursions at all sorts of times, the mumbling of "Permission to leave the ship" as he steps over the rail soon becomes an empty form and is relegated to the subconscious. Furthermore, Evans was quite accustomed to climbing down into the motor-sailer from the boom in order to rig a temporary transmitter in her for testing some of the radio gear aboard the ship. For such a purpose the formal permission to leave the ship was commonly waived or completely overlooked. Therefore, it was not wholly unnatural that when Evans came on deck, in his eagerness to convey his news to Barton he simply forgot all about formalities and made for the boom. Running nimbly out on it and slipping down the ladder, he hailed the coxswain of the motor-sailer, who swung in a few feet from his course to take him aboard. Ensign Coffee was officer of the deck at the time, and witnessed the performance. This mode of leaving the ship was not for a moment to be countenanced. Seizing a megaphone this irate officer called sharply to the coxswain and ordered him to return at once to the ship, and, when she was at the gangway, ordered Evans to come aboard, then sent the motor-sailer once more on her way.

"What does this mean?" asked Coffee sternly. "Why didn't you come and ask permission to leave the ship?"

"I came on deck after the boat had shoved off," answered Evans, now in the position of a schoolboy caught playing truant; "I had an urgent errand on shore in connection with the radio apparatus, and as I had always been granted permission so regularly that I had come to take it as a matter of course, I simply didn't think of it, but, in my haste, made for the boat as I saw her go by the boom."

"Well, you won't take it as a matter of course any more," said Coffee. "That sounds to me like a pretty thin excuse. Go to your room and we'll look into this matter a little further."

Evans looked Coffee squarely in the eyes and said quietly but earnestly, "May I speak to the Captain first? It is about a matter of great importance, and there's no time to lose."

"I am the officer of the deck," answered Coffee with great dignity, "and I represent the Captain as far as you are concerned. I have heard more than I wish to hear from you already. Go to your room."

The corporal of the guard and a quartermaster were standing by watching the scene. Evans hesitated a moment wondering if there were any way of persuading Coffee that a real emergency existed, but the look of the man convinced him that he might as well talk to a pumpkin. A futile attempt would only do harm. Therefore he went to his room and sat down to think matters over.

Ensign Coffee reported this incident to the executive officer of the flagship. Fraser and Elkins were already ashore with Barton, and the executive officer knew nothing of Evans and his duties, but the incident looked to him suspicious. He therefore started inquiries as to Evans's

activities aboard the ship. When he learned that he had been making changes in the radio receiver, the exact nature of which was not fully understood by any one else on the ship, he concluded that Evans required close watching, and ordered him confined to his room with a guard at the door.

Here was a nice situation. Fraser, Elkins, and Barton away for at least twenty-four hours; Evans locked in his room with little or no hope of release till they should return. In that time Long might work untold damage to the radio room; there were hidden parts of the mechanism that he might break, which would take weeks to repair. Worse than this, he might by skillful questioning draw valuable information from the operators; he might even get hold of secret code books, and then on the pretext of making tests on the transmitter, send out signals in a code of his own that would divulge vital information to the enemy. Worst of all, he might find some clue to the secret of the stolen code and how by its aid the seven submarines had been lured to their doom. Then all that was hoped for by the further use of this talisman would be lost. In his agony of apprehension Evans became almost frantic. He racked his brains to think of some line of action. When the guard was placed at his door, he realized his utter helplessness to do anything to avert disaster. He knew that Barton had confided nothing of his unusual status to any of his colleagues in the Bureau of Intelligence; it would avail little to communicate with them even if he were able. After all, what was his status? A radiogunner, and nothing more. His private conversations with Barton were purely informal, and gave him no official claim whatever to the consideration of other officers who were not acquainted with him. Still, if he could only have an interview with some officer in the Intelligence Bureau he might be able to secure action; the emergency would

justify his telling things it had hitherto been his rule to mention to none but Barton.

With an effort at composure he began talking to himself.

"This is a pretty pickle for me," he said aloud. "I suppose they'll be having the Intelligence officers out here to put me through the third degree. Then what'll happen?"

The guard heard, and, when relieved, reported his remarks to the executive officer.

"Well, I think the best medicine for him is to let his fears come true," said this officer.

He did not consider it worth while to do anything that evening, but early next morning he dispatched a note ashore, requesting of the Intelligence Bureau an officer to investigate some suspicious conduct on the part of one of the ship's company. On receipt of this message a young lieutenant attached to Commander Barton's office was sent aboard the flagship to make the investigation.

Now Barton, as is the way of some Intelligence officers, did not confide all he knew to his colleagues. No one in his entire force knew the nature of his relations with Evans; few of them even knew of the latter's existence. Therefore, when the young lieutenant undertook his mission he had wholly new ground to break.

The night had been for Evans one of acute mental torture. Visions of Long's possible revelations to the enemy kept rising before him. Suddenly it flashed on his mind that Long was the same radio gunner that had been on the *Sheridan* when she was wrecked. Out of the depths of his subconscious memories came the words of the operator whom he had questioned on his visit to the wrecked ship in the Boston Navy Yard:

"He was here in the shack and sent me to get some wire

or something from the main radio room an hour or so before we struck."

What a dunce he had been not to think of it before! Long had gone aboard the *Sheridan* to shift the position of that circular scale, after first showing the navigator how well the radio compass worked, so that he would trust it. It wasn't his own idea, either; Rich had sent him — Evans would bet his last dollar on that. Of course, it all fitted in with that gallant officer's denunciation of radio compasses in general to Mortimer as soon as the *Sheridan* went aground. What about the Gloucester station? Ten to one some one else had been tampering with that at the same time, only there he had had an opportunity to cover his tracks by putting things back in their proper adjustment afterwards, whereas on the *Sheridan* the operator had stayed in the shack till they took to the boats, and Long had had no chance to put the scale back where it belonged.

Now this devil was here in the flagship's radio room at the behest of Rich, with a free hand for nearly twenty-four hours. And Evans had lost his chance to trip him up. Never had he suffered so in all his life. At last, realizing the hopelessness of attempting to do anything before morning, he tried to sleep. But sleep would not come. Toward morning he dozed occasionally only to wake with a start as apprehension began to assume the reality of a dream image, and the nightmare sense that his fears had come true roused him again to full consciousness.

In the morning, when the young officer from the Intelligence Bureau arrived, he found Evans looking haggard and worn, with deep circles under his eyes, like one haunted by a bad conscience. Evans welcomed his arrival and endeavored to explain the situation, but the officer cut short his explanations, rebuking him sharply for trying to shift

the blame to a fellow warrant officer. It soon became evident that his investigator had his mind made up that Evans was engaged in some plot, and could not be made to listen to anything he said. Evans also became convinced that specific information about Long would not only be disbelieved, but was apt to be repeated indiscreetly to some one who would pass it on to others, till Long would hear of it and be put on his guard. Clearly, then, the less he told this officer the better. He therefore abandoned his attempt to explain matters and became as non-committal as possible.

The Intelligence officer sought to question Evans concerning his activities aboard the ship. All he could elicit from him was that he had been sent by the Bureau of Engineering to look after the efficiency of the radio apparatus in the fleet and to effect whatever repairs were needed to make it do what was wanted of it. More detailed questions brought out only technicalities that he did not understand. He tried frightening him into making confessions, but Evans's equanimity remained unruffled.

The lieutenant was stumped, and was debating what his next move should be, when Evans said:

"Shall you see Commander Barton when you go ashore?"

"Yes. Why?" answered the other, taken aback.

"If you don't mind, I should be grateful if you would tell him that I should like very much to see him as soon as possible. You have my name?"

"I have your name," said the young lieutenant, astonished. "Perhaps you'll see more of Commander Barton than you want."

Here was a bit of cool effrontery the like of which he had never seen. What could it mean? Perhaps it might be a clue, but how to interpret it was beyond him. Perhaps he

had better report his interview to Commander Barton and see if he could make anything of it.

First, he went to the executive officer and told him that the case was very puzzling, that he thought he had made a little progress, but had best confer with Commander Barton before going further. It was not till late that afternoon that Barton returned to Headquarters in Punta Delgada. As soon as he arrived, the young lieutenant who had interviewed Evans reported the whole story to his chief. Commander Barton listened gravely, and at the end said, "You did quite right to come back and report to me. I'll go aboard and look into it myself."

Barton lost no time getting aboard the flagship and down to Evans's room. He dismissed the guard, and, entering, found Evans in a state of mind which showed him that a situation of no ordinary sort had arisen. Evans hastily told him what had happened and mentioned briefly his reasons for believing that Commander Rich was at the bottom of the plot, including what he knew of Long's part in the *Sheridan* affair. Barton listened attentively and thought a moment.

"Some time I'll tell you something else about that *Sheridan* business," he said; "but now the thing to do is to get this man Long locked up at once."

"Do you suppose you could get some useful information by keeping him under observation awhile without letting him know he's under arrest?" asked Evans.

"We might do that; anyway, we must be about it. Wait here till I see Fraser."

Fraser and Elkins had returned to the flagship before Barton had come aboard, but the executive officer had not deemed it worth while telling the chief of staff about Evans's conduct and subsequent confinement. Barton now ex-

plained to Fraser what had happened, still not intimating that Evans was in the habit of having secret conferences with him, but merely putting his actions on the ground of his sense of the importance of reporting what he had learned to Intelligence Headquarters, in the absence of Elkins. Evans was sent for, and explained to Fraser in detail what had happened in the radio room. It was then decided that Fraser should tell Long that he was wanted for certain important duties at Intelligence Headquarters, and should send him ashore with Barton.

Long was found in the radio room examining some of the newer apparatus, but apparently not meddling with it at the moment. He was told that his services had been requested by the Intelligence Bureau, and that the chief of staff desired him to get his personal effects and go ashore at once with Commander Barton who was waiting for him. At Headquarters he was given supper, and then shown to his quarters. He was to sleep in a room with another warrant officer, and in the morning his new duties would be explained to him. He turned in early, and through the night sentries from concealed positions kept watch on the door and window of his room.

In the mean time on board the flagship, Evans hastened to the radio room to ascertain, if possible, what mischief Long had been up to. He questioned the operators who had been on watch, avoiding any implication that he suspected mischief, merely putting his questions as if interested only in the amount of progress made. In this way he was able to get a preliminary idea as to which pieces of apparatus he had best examine for evidence of tampering. He also contrived, without arousing their curiosity, to question the operators further as to Long's activities. Had he tested any of the transmitters? Yes, he had sent signals with

considerable power for nearly half an hour. Had he called any station in doing so? Apparently not; he seemed to be just testing the gear and sending blank signals. Anyway, he had not made use of any of the codes; all the code books had been locked up all the time. This latter news, at least, was good; but what were the blank signals that Long had sent? This was now the main question, and Evans saw no way to answer it.

Before Barton went ashore with his unwitting prisoner, he and Evans had agreed that no time should be lost in warning Mortimer of Rich's probable complicity in the plot.

"Use your special method of reaching the Secretary," Barton had said. "We have no means as prompt and as free from the danger of leakage as that."

So now, before waiting to make a thorough search for damage to the extensive array of apparatus in the room, Evans merely assured himself that a certain transmitter was in working order, and sat down to make one of his periodical "tests of its efficiency." It will be recalled that two civilian experts in the Bureau of Engineering, Tompkins and Rand by name, were the men whom Evans had charged Mortimer to keep ever on the job to apprise him of such messages as Evans might send. On this particular evening in Washington, Tompkins had the duty. At a late hour that night, the following message came into his hands:

We have evidence suggesting that the man I warned you against last spring is involved in treason. Watch him closely. E.

Tompkins telephoned at once to Mortimer's house to ask if he could see him, but was told that the Secretary had gone to bed very tired. He decided to wait till morning. The next day he went early to the Secretary's office, but was told that Mortimer had not yet arrived. He therefore

returned to his own office in the Bureau of Engineering to attend to some business. As soon as he felt sure the Secretary would be in his office, he set out again to deliver his message.

Now during the night while Evans was confined to his room under guard, Long had asked many questions of the operators on watch in the radio room. Among other things he learned that Evans not infrequently sent dummy messages to "test the transmitter." It was after he had learned this that Long did the same thing himself. Within two hours Commander Rich in Washington had received a slip of paper with the following words written on it:

E. has been sending out signals.
Watch for delivery to Sec. L.

When Tompkins left his office in quest of Mortimer, he was confronted by Commander Rich.

"I understand you were looking for the Secretary this morning," he said. "You must understand that no one in the Bureau is permitted to communicate with any one except through his immediate superior. If you have anything to communicate to the Secretary, you must do so through me."

"I understood," replied Tompkins, "that as a civilian employee that rule did not apply to me. I have merely an unofficial message for the Secretary."

"As long as you are working in this division of the Bureau you are under my orders," said Rich. "If you have a message for the Secretary, give it to me and I will see that it is delivered promptly."

Tompkins did not know against whom Evans had warned Mortimer, and had no reason to suspect Rich of anything more than a desire to assert his authority, yet he knew that

he should entrust this message to no one, but should deliver it in person.

He therefore replied, "It is the Secretary's wish that I should deliver this message to him myself."

"It is the Secretary's wish that discipline should be maintained in the Department, and that orders should be obeyed. It is by his authority that every one in this division of the Bureau is under my orders. You will therefore hand over the message to me."

"I am afraid that I cannot do so without the express authority of the Secretary," replied Tompkins.

A dark flush of anger appeared on Rich's face, but he controlled himself and took another tack.

"See here," he said; "I understand about these confidential messages. You are making an unnecessary fuss over nothing. The Secretary wants me to keep things going through the regular channels as far as possible, and cut out some of the irregularities that are apt to appear if we get too slack about the regulations, that's all. However, to set your mind at rest I'll get him on the telephone and let him reassure you himself. Come into my room while I call him."

Tompkins followed Rich into his private office where Rich sat down at his desk and took up the telephone receiver.

"Give me Secretary Mortimer," he said. Then in a few seconds, "Mr. Secretary? Good-morning. Do you recall speaking to me about stiffening up the regulations and seeing that all communications went through the proper channels? . . . Well, Mr. Tompkins, one of our expert radio aides, has a message for you that he wants to deliver in person. He has scruples about entrusting it to me; I thought you might like to reassure him yourself. He's right here."

Rich then handed the telephone to Tompkins who was answered by a voice that he recognized clearly as Mortimer's, saying, "That's all right, Tompkins; give Commander Rich the message. I think it's a better way; it will excite less notice if you don't keep coming to my office."

There seemed now to be no doubt that he must do as he was told; so he drew from his pocket the sealed envelope containing the message and handed it to Commander Rich, who received it graciously, saying, "You see the Secretary and I are in perfect understanding about all this; you need have no fears."

His manner was both authoritative and reassuring, yet as Tompkins left the room he felt a qualm of uneasiness at leaving the message behind him. He contemplated talking the affair over with Rand, but their duties kept them in the midst of other people during the day, and no good opportunity to do so appeared.

Half an hour after Tompkins left his message with Rich, a messenger from the Bureau of Engineering called at Mortimer's office and asked to see the Secretary, saying he had an urgent message. He was shown in, handed a sealed envelope to Mortimer and withdrew. Mortimer opened the envelope and read with amazement the words:

Recall Fraser to Washington at once. Urgent. E.

He examined the handwriting carefully; surely it was that of Tompkins. But why had not Tompkins delivered it in person? He reached for his telephone and asked for the Bureau of Engineering. Getting the Bureau, he asked for Tompkins, but his call was answered by Commander Rich.

"Mr. Secretary? Good-morning," he said. "Mr. Tompkins received a confidential message for you this morning just as he was leaving the office in response to a

telegram saying that his wife, who is out of town, had been taken seriously ill. The poor man was distracted, for he felt that he must deliver this message to you in person, yet he hadn't a moment to spare to catch his train. I told him to go to his wife, and promised I would deliver the message to you at once. So I sent it round by a trustworthy messenger. It was just as he handed it to me with the seal unbroken."

Mortimer pondered the question. Could there be a mistake? Evans had assured him that his system was as proof against error as was humanly possible, safeguarded by a method of double-checking to ensure it against the misspelling of names. It had never failed. And there before him was this surprising message in Tompkins's own hand. Why should Fraser be recalled? There must be a good reason. Having excluded every possible source of error he could imagine, he concluded that he had best maintain his faith in Evans who had never yet failed him. He therefore arranged to have orders cabled to Punta Delgada detaching Captain Fraser to return immediately to Washington.

That afternoon, at the end of the day's work, Tompkins had just arrived at his rooms when he was called to the telephone. Again he recognized Secretary Mortimer's voice.

"Mr. Tompkins, I want to see you about a matter of great importance. I will send my car to your rooms to bring you to my house. The car will be there in about ten minutes; please be ready for it."

In ten minutes a limousine drew up in front of the door. The chauffeur wore a smart livery. Seated in the tonneau was another man. Tompkins stepped in and sat down beside him.

"Good-evening," said the man. "I wonder what this conference is about; the Secretary merely asked me to come to his house. I'm in the electrical manufacturing business."

The car started rapidly and soon turned into an unfrequented street; there it slowed down. Two men ran out from the sidewalk, jumped on the running-board, and the car sped on. One of the men got into the tonneau beside Tompkins, and instantly seized his hands, while the electrical manufacturer threw a gag over his mouth. He was also blindfolded, so that thenceforth he knew not where they were going. For seven hours the car sped on through the night, and toward the end of the journey the sound of the engine told him it was climbing a considerable grade. The road became rougher, then rougher still. At last, some time after midnight, the car stopped, and Tompkins was taken out and conducted through an overgrown wood road for some distance to an abandoned lumberman's shack where the gag and blindfold bandage were removed, and he found himself surrounded by six armed men. He had not the remotest idea where he was, but evidently it was far from Washington. The hut in reality was in the fastnesses of the Shenandoah Mountains. It would have been a simple matter to seal his lips for all time, but Rich had instructed that instead he be carefully guarded in the hope that by appropriate treatment useful information might be extracted from him. And here let us leave him.

The next morning, early, before any one else had arrived at the Bureau, Commander Rich was in his office, pacing up and down. Presently there was a knock at the door, and a man with a sallow face entered.

"How about it?" said Rich quickly.

"They got him off, all right. I've just been talking with Calvani by long-distance phone. He had just got down out of the mountains, and says they've lodged the beggar where you told 'em to."

"Good," said Rich, and lit a cigarette.

"I wonder how many more of these secret messengers there are knocking round the works," he continued; then, scowling, added, "We haven't got to the bottom of all this business yet. I'd give anything to know where that man Heringham disappeared to, and what he's up to. Why in hell didn't you get the dope on him while you were there in London?"

"I couldn't shadow both him and Evans when they separated," was the answer; "and I thought Evans was the more important."

"Remember, hereafter," muttered Rich savagely, "that I like results a whole lot better than excuses."

And with that he sat down at his desk and waved the sallow man away.

At Punta Delgada, Evans, having sent his message of warning about Rich, proceeded to examine all the apparatus which the information of the operators led him to suspect that Long had molested. Considerable damage had been done, always of the same sort as that which he found in the receiver. The man certainly was ingenious. Inaccessible parts had been broken or damaged in a manner calculated to do the maximum harm with the minimum symptoms, so that it would be a long time before the operators suspected that anything was wrong, and longer still before they could trace the trouble to its cause. He was relieved to find that, troublesome as was the breakage, the worst of it could be repaired within a week. What bothered him most now was the question — what and to whom had Long been signaling in his half-hour's test? His worst fear was that Long might have discovered some clue to the secret of Wellman's stolen code book, and passed it on to his confederates.

CHAPTER XII

THE VICTIM

AT Intelligence Headquarters in Punta Delgada there was an expert psychologist, versed in all the latest and most scientific methods of probing a man's veracity. With a sensitive galvanometer connected to the hands of the subject, he could detect the slightest emotional disturbance when no other evidence would reveal it. The morning after Long was taken ashore with the understanding that his skill as an electrician was to be utilized at Headquarters, Barton explained to him that the task they wanted him for was one requiring presence of mind and other faculties for which they wished to give him a psychological test. Barton was well aware that as likely as not Long knew he was caught, and was not to be fooled; but what if he did? They had him, and he would have to submit to their test in any case. And in any case their tests would reveal what they wanted. Since uncertainty as to whether he was a prisoner or not was apt to increase Long's emotional instability, it seemed best to keep up the bluff of a *bona-fide* test of his fitness.

Long was placed in a comfortable chair with his hands in contact with electrodes connected with the galvanometer whose mirror threw a spot of light on a screen which the psychologist could watch, but which Long could not. The psychologist then asked him questions or analyzed his association processes with test words, observing the motion of the spot of light on the screen. Some questions were calculated to test his knowledge of electricity; others were apparently frivolous and pointless. Whenever a question or

word aroused an emotional response, the spot would make a quick excursion across the screen. After a series of idle-seeming questions, the psychologist made a remark which was not calculated to ruffle the composure of any one, except that it contained the name Wellman. Long continued to present an imperturbable exterior, but the spot of light made the largest excursion that had yet appeared. Some more unimportant patter followed which permitted the spot of light to come to rest again. Another insignificant remark was made containing a casual reference to the name of Rich. The spot of light moved quickly on the screen and registered an even larger excursion than had followed the name of Wellman. At this juncture Evans quietly entered the room through a door behind Long's back. At a signal from the psychologist, he addressed a casual remark to Barton. At the sound of his voice the spot of light shot off the scale on the screen. When it had steadied again somewhat, Barton said to Evans, "By the way, you said you had some repairs to make on that small transmitter; have you got it working all right this morning?" Again the spot of light went off the scale; a pulse-recording device showed Long's heart beating rapidly, and now beads of sweat stood out on his forehead. His agitated state was completely ignored, and the test went on, more innocuous talk being used to steady the spot of light. Barton then dropped a harmless remark to Evans about Commander Rich, and once again the spot jumped in a way that could never have been due to instrumental error or chance. Long was then formally made prisoner.

Scarcely had this job been completed when Barton and Evans were fairly stunned by the news that a dispatch had been received at Communication Headquarters ordering Captain Fraser detached from duty as chief of staff and to

proceed immediately to Washington on whatever cruiser could best be spared from the fleet. What on earth could this mean? With the momentous preparations for action in progress, Fraser was never needed in the fleet as much as now. The obvious inference was that some crucial question had arisen in Washington, and he was wanted for a conference. Yet Evans could not escape the feeling that something was wrong; he could not help associating this new development with the activities of Long and Rich. As head of the Radio Division of the important Bureau of Engineering, Rich had the means at his hand of wielding vast power for evil. Very likely he had created a situation for recalling Fraser, knowing his to be the controlling mind in the fleet; and quite possibly he would contrive to have a swarm of enemy submarines lurking in the path of the cruiser that was to take him home; or perhaps a mine-field would be laid across her path as she approached home waters; perhaps some intrigue was on foot to get Fraser discredited and put on the shelf when he reached Washington. As a matter of fact, Rich was at the moment considering all these possibilities of turning to account the removal of Fraser from the fleet.

Evans and Barton at once held a conference on the subject. Barton was at first inclined to assume that there was a good reason for Fraser's recall and to advise leaving matters alone until further developments should arise. He did not feel that there was adequate reason to suppose that Evans's secret method of communication had broken down. If it had not, Mortimer would already be investigating Rich, and any unnecessary use of the method would add to the danger of its discovery. If the method had broken down, any message Evans might send would go to Rich instead of to Mortimer and would thus serve only to help

the wrong man by giving him information and putting him on his guard. Finally, however, Evans succeeded in convincing Barton that a show-down might avert disaster, and should be attempted at once. He therefore went to Communication Headquarters and began once more to "test a transmitter."

Late that afternoon — the same day that Mortimer had received the message about Fraser and acted on it — Rand received this message:

Go to M. in person, put nothing on paper, ask him verbally to repeat back to me all messages received from me in this way in the last two days. If you cannot do so, let me know. Avoid head of division; danger. E.

Tompkins had just left the office for his rooms, whence he had gone on his long and uncomfortable motor ride. Whatever caution and watchfulness Rand possessed was now thoroughly aroused. He felt as if all the sentries, yeomen, and orderlies in the Bureau were watching him. Taking pains not to digress in any particular from his usual routine, he put on his hat and coat and started home. But when he had reached a corridor where he was unobserved, he took a roundabout way to the Secretary's office, where he found Mortimer just getting ready to go home.

Mortimer frowned as Rand repeated his message to him.

"What's troubling Jim now?" he said to himself. "Is he still having notions about Rich?"

Then he said aloud to Rand, "Was there nothing more?"

"No, sir."

"Well," said Mortimer, "the only message I've received from him for some time was as follows: 'Recall Fraser to Washington at once. Urgent.' You can repeat that back to him and tell him that is all."

"When did that come?" said Rand.

"This morning," said Mortimer. "Commander Rich sent it to me by special messenger when Tompkins was called away."

"Tompkins called away? Where?"

"Commander Rich said he had been wired for because his wife was very sick; he had barely time to catch his train; so the Commander delivered the message for him."

"His wife sick!" echoed Rand. "He's not married."

"Then perhaps it was his mother, I forget which," said Mortimer.

"But he's been working in the Bureau all day. I saw him walk out of the office not half an hour ago."

When Commander Rich planned his trick, he knew nothing of Rand's part in the system. His only intimations were the message of warning from Long and the report of the spies he had posted in consequence of that warning, to the effect that Tompkins had been seen trying to find the Secretary. He had taken a gambler's chance, and not an unreasonable one, that Mortimer would hear nothing of an obscure employee in the Bureau between the time of his alleged departure and the time when his kidnapers should get him away from the city. But his gambler's luck had failed him.

Mortimer was thunderstruck. The message Rand had brought him took on a new meaning. A council of war was held to guard against interception or leakage in the exchange of messages with Evans which must now proceed as rapidly as possible till the mystery should be cleared up. Rand was told to repeat back to Evans the message about Fraser at once.

In half an hour Evans in the radio station at Punta Delgada received it, with difficulty containing his feelings lest the operators about him should be started speculating about

what did not concern them. Without waiting to tell Barton what had happened, he sent back the following:

Message as repeated was never sent from here. True message was this: "We have evidence suggesting that the man I warned you against last spring is involved in treason. Watch him closely." To-day more evidence has appeared in confirmation. Fraser sorely needed in fleet; is already on board cruiser bound for States.

Nervously Mortimer and Rand waited, discussing the ominous possibilities of this crisis, till the message from Punta Delgada arrived. Then Mortimer broke all records for speed in doing two things: one was to tell the Chief of Naval Intelligence what had happened; the other was to cable Punta Delgada canceling the orders recalling Fraser and directing him to return at once to the fleet.

Captain Fraser, turning over his duties to the assistant chief of staff, had boarded a fast scout cruiser and left the harbor of Punta Delgada for the open sea late in the evening. The night was dark, and by midnight the island of Saint Michael's had disappeared astern, when Fraser was roused from his sleep by a messenger with word that an important radio message for him had just been received. To his surprise he found that he had been directed to return at once to Punta Delgada.

"Well, what next, I wonder?" he said to himself. "Something damn funny seems to be going on."

He sent back a radio ordering the arrangements to be made for opening the gates in the nets to allow the cruiser to return to harbor, and then, going up on the bridge, told the officer of the deck to change course one hundred and eighty degrees and return to port. Before dawn the cruiser was back at her moorings in the harbor.

Barton and Evans had both agreed that they had best

continue to keep to themselves the secret of Evans's confidential relations with Mortimer, and especially his secret method of communicating with Washington. Barton therefore called on Fraser and merely explained that he had been advised through secret channels from Washington that Fraser's recall had resulted in some way from the intrigue of a group of spies, and that their plot had been discovered in time to cancel the orders immediately after they were issued.

Meanwhile in Washington, Mortimer, as soon as he received the message from Punta Delgada revealing the trick and casting suspicion on Rich, went to Admiral Rallston, Chief of Naval Intelligence, and discussed the problem with him. This officer cautioned him against taking anything for granted.

"Clearly a dangerous spy is at work," he said, "but let us not be too hasty in placing the guilt. It behooves us to be cautious about concluding that a man in Commander Rich's position is guilty of treason. The spy, whoever he is, will use every means he can think of to make the blame appear unmistakably to fall on some one else. It is easy to tap wires, you know."

"That's so," said Mortimer. "What is the best move?"

"I advise you to go to Commander Rich to-morrow morning and, without intimating that anything is amiss, refer to your telephone conversation. If he does not deny having had such a conversation, ask him to explain the discrepancy about Tompkins. You can judge from his conversation whether he's in a hole or whether some one else has framed the thing up."

Mortimer passed an uneasy night. The next morning he went to the office of Commander Rich. While he had been in bed the message which caused Fraser to turn back to

Punta Delgada had been sent and received, and his ship, turning back, had already reached the harbor. It was by no miracle that these facts had found their way to certain persons in Washington who had to do with radio apparatus; nor was it surprising that the man who controlled all radio apparatus at its source got wind of them before Mortimer made his call.

Before Mortimer was up and about, Commander Rich sent for a certain henchman named Goss, and in the privacy of his room spoke to him thus: "When the supreme test of duty comes, the faithful will not fail. Our ruse has been betrayed. Yesterday morning I told the Secretary that Tompkins had been called away by family sickness. The chances were a thousand to one he would never hear that Tompkins was in the Bureau after I said he had gone. By some mischance his suspicions have been aroused; last night he canceled orders issued in the morning. Soon he will come to question me. It is of supreme importance for the cause we serve that I should stay at my post. I shall deny the telephone conversation and tell him some one has played a trick and impersonated me. But that will not suffice. To make my position secure, I must find some one who can mimic my voice well enough to have deceived the Secretary. Your power of mimicry deceived Tompkins. You will be called on to show what you can do, avowedly for another purpose, and you must play your part. I do you the honor to call on you for this sacrifice."

An agonized look spread over the face of Goss.

"Master, is there no other way?" he said.

"None," replied Rich. "I must stay, and you must go; the cause demands it. By good fortune you may yet escape the extreme penalty. We must also have evidence of tampering with the wires. Go quickly to the Bureau before

any one is about, and, in a well-concealed place, cut the wires from the switchboard to Tompkins's desk, then splice them together again and put tape around the splices.

"When you are questioned, protest your innocence till the case is proved against you. Own no master nearer than Constantinople. Tompkins will not return; but, remember, you know nothing of that."

When Mortimer called on Commander Rich at his office that morning, Rich received him with disarming cordiality and equanimity. Indeed, he did not look like a guilty man.

"Do you recall our telephone conversation yesterday morning?" said Mortimer.

"No," said Rich with a puzzled look. "I had forgotten we had one. What was it about?"

"About Tompkins."

"Tompkins?" said Rich. "Who is he?"

"An expert radio aide in your division. You said he had a message for me."

"I know the man you mean now; we have several aides, and I see so little of them individually I am apt to forget their names. But I recall nothing about any message. What was it?"

"You said he had a message he wished to deliver to me in person, but was in a great hurry to catch a train because of serious illness in his family. For that reason you undertook to deliver the message by special messenger."

"Mr. Secretary, I am certain that I had no such conversation with you; this is the first I have heard of it. Some one else must have impersonated me."

"That is strange," said Mortimer, "for it was I that called this Bureau. I had received the message, and, being surprised at its contents, I called up the Radio Division, and asked for Tompkins. I was answered by your voice

saying, 'Commander Rich speaking,' and following with the statement I just told you. I have since learned that the message as delivered to me was quite different from that which was originally sent."

"Most extraordinary," said Rich, frowning. "There must be some one up to mischief."

He thought a moment, then resumed:

"Some one understanding the wires could have cut them and connected them with a portable phone."

"But how was it that I heard your voice?"

"A good mimic could easily have deceived you over the telephone. Was the message very important?"

"Very."

"This looks like a serious plot," said Rich. "Some enemy agent must have access to the wires in our Bureau; most probably he has been planted in the Bureau itself. I will track this thing down at once."

"Hadn't you better get in touch with the Bureau of Naval Intelligence about it?" said Mortimer.

"Yes; I'll get them to send over a man who is good on wiring and that sort of thing," said Rich. "With a clue like this we should be able to find the culprit shortly. We can question some of the officers and a few of the more trustworthy draftsmen and yeomen as to who was in the vicinity of those wires yesterday morning. I haven't a doubt we shall find our man."

Mortimer returned to Admiral Rallston in the Bureau of Naval Intelligence and told him of the interview. Rich had seemed so thoroughly in earnest he could not help but believe in his ignorance of the whole affair, especially since in his own opening question to Rich he had not even hinted that anything was wrong; he had merely asked if he recalled the conversation. If Rich had been the villain, why should

he have changed his tactics overnight before receiving any intimation that the message had been changed? Why should he not have stood by his story of the day before? It all looked as if the spy were some one else. Admiral Rallston concurred in this view. They would give Rich what help he wanted in finding the spy, and await results.

That very afternoon Rich called at the room of Secretary Mortimer. He already had two very important clues. A place had been found where the wires to Tompkins's desk had recently been cut and then spliced together again. This explained the method whereby some one impersonating Rich had been substituted for Tompkins on the line. Besides this a certain chief electrician named Goss had been seen with a portable telephone going through some of the rooms in that vicinity yesterday morning. Goss was a man of unknown antecedents who looked like a southern European of some sort; he had been known to entertain the others by mimicry on one occasion. Rich proposed that, by way of a trap, they approach Goss and tell him they have some special detective work in which his help is desired; that they understand he is a fair mimic, and would like to see what he can do, since that faculty will be of assistance.

"I feel confident that he is our man," said Rich. "If we show no signs of suspecting him, but offer him the prospect of receiving increased confidence, it will be just what he wants, and he will probably display his talent. We can then confront him with the cut wires and the evidence that some one was tampering with the line yesterday, and that none but he could have done it. It is not unlikely that he will then break down and confess."

Mortimer agreed to this ruse, and went with Rich to his office, where they met Admiral Rallston, who recalled the name of Goss as being under suspicion of tampering with

some radio gear. Goss was summoned, and Rich explained to him that the Secretary wished a good electrician for certain special duty requiring resource and presence of mind, and that he, Rich, had selected him as a good candidate for the task. Mortimer then questioned Goss as to his experience. Then Rich addressed him.

"The Secretary tells me that in this work there may be occasion for you to imitate the voice of another over the telephone. They tell me that one day you amused the men in the drafting room by mimicking some other members of the division. If you can do that, it will be very useful."

"I was just doing it for fun," said Goss. "I don't know as I could really fool any one."

"Let me hear you mimic Commander Rich," said Mortimer.

Upon this Goss said a characteristic sentence in which he aped the voice and manner of his master with such skill that Mortimer laughed and Rich blushed in spite of himself. Goss glanced at Rich for an instant. In the glance Rich saw a look of pathetic appeal; and even in his hard and cruel heart there was a shadow of admiration and pity as he realized how his henchman had shown his talent at its best, though the revelation sealed his doom.

Rich cast a knowing glance at Mortimer who saw the convincing significance of the demonstration. The action then moved swiftly. Admiral Rallston took the lead and told Goss they wanted him to look over some wires with them. Then he led the way, followed by Mortimer, Rich, and Goss, to the severed wires, and, suddenly lifting the plank that hid them, turned sharply on Goss, saying, "We want to know who cut and spliced those wires."

Goss, true to his master, appeared confused and disconcerted; then, with a visible effort to regain his com-

posure, professed his ignorance of the matter. Mortimer and Rich looked on as Admiral Rallston grilled his victim. At last they wrung from him a confession that he served the Sultan, but when questioned as to his confederates he stoutly insisted that he was his own master; Headquarters in Constantinople had sent him and from none other had he taken orders.

With the fatalism of the Moslem he faced his execution. Rich was now more strongly entrenched than ever in the good graces of the Navy Department. His promptitude in finding the real spy had won him the warmest commendation.

The day after Goss had confessed to cutting the wires and impersonating Commander Rich, Mortimer instructed Rand to send a secret message to Evans informing him that the original suspect had been exonerated, and had in fact assisted them in finding the real spy who was now imprisoned under a strong guard, and awaiting execution. When Evans received this message his mind was troubled. He conferred again with Barton and told him he was not satisfied.

"I'll bet my last dollar that scoundrel is the guilty one," he said. "He's just pulling their legs."

He reviewed the evidence in detail.

"I believe you're right," said Barton. "But it's hard to convince them at this distance. I didn't tell you," he continued after a pause, "what I learned about the *Sheridan* affair."

"What was it?"

"You recall that when the *Sheridan* asked for bearings, Fourth Cliff was reported out of commission and Gloucester gave a bearing that was found afterwards to have been sixteen degrees in error? I sent one of the best Intelligence

officers in the Bureau to investigate. He found that a certain chief radio electrician named Goss, from the Bureau of Engineering, had been to Fourth Cliff early that morning to inspect the station, and had come to Gloucester at noon. He was alone in the radio-compass shack there for a few minutes just after lunch, and again about dusk just after the *Sheridan* went aground. The most careful examination of the apparatus revealed nothing definite, but the set-screw which holds the circular scale in place looked as if it had recently been tightened."

"My God!" cried Evans, "what a jackass I was not to get on to that. It fits into the rest like the last piece in a picture puzzle. Look here! The activities of those two men, Goss and Long, must have been carefully planned beforehand. One of the most puzzling things of all was the way those three bearings, although two of them were wildly inaccurate, checked up with each other well enough to convince a careful navigator in a fog. If the gear had been thrown out of true by haphazard amounts they never would have given bearings so consistent with each other, except by the merest chance. Those devils must have decided where they wanted to locate the ship in order to put her aground; then they must have worked out the errors scientifically in the light of the ship's actual position; and they did a damn smart job of it."

"Possibly Long sent a message from the ship in some secret code, telling Goss where they were, so that he could calculate the desired error," said Barton.

"That's the most probable bet," said Evans. "Anyway, it shows clearly that there was careful planning from some headquarters of deviltry, which, unless I'm much mistaken, means Rich."

"Goss is being watched, but thus far we haven't pinned

anything on him," said Barton. "No suspicion of Rich has been mentioned hitherto."

"Seems to me," said Evans, "it's up to you to go to Washington as quick as you can get there, and have him strung up."

Barton looked perplexed.

"It would be rather hard to arrange," he said, "and would attract attention that might prove embarrassing. Then, too, it might be very hard to pin anything on Rich with the evidence we have at present. He's so clever, and so well entrenched, he can probably work all kinds of alibis. I think perhaps the best policy is just to keep the lid on tight out here, and not let any strategic messages go out to Washington at all."

"But he may have other men like Long planted here in the fleet with all kinds of secret methods of sending messages in code," said Evans. "It's too dangerous to let a man like that stay where he can function as the brains of the whole intrigue. We don't know how he may contrive to cripple us. If he gets on to the secret of Wellman's code book we've lost a weapon worth many ships. As to evidence, I'll bet I can get some information straight from headquarters through Kendrick and Heringham."

Barton shook his head.

"I wouldn't," he said. "Sending names of persons, even disguised in as good a code as yours, involves a terrible risk."

"It's a terrible risk if we don't," said Evans earnestly. "We are staking the whole war on our naval strategy, and what will all our strategy avail with a thing like this at the heart of our communication system in Washington? Every bit of evidence we can get may be needed to dislodge him. The risk of leakage in communicating with Heringham is nothing to the risk of leaving Rich where he is."

Barton thought awhile.

"You are right," he said at last. "Send your message to Heringham and, when we hear from him, I'll see whether it's best to go to Washington, or what to do."

Once more Evans tested a transmitter. For twenty-four hours he waited, on pins and needles, and during those twenty-four hours both Kendrick and Heringham lost some sleep, too; also some one in Constantinople who knew how to make Bela talk did so. The return message which Evans deciphered from the radio traffic at Gibraltar caused him to go to Barton and urge on him more insistently than ever the importance of his going at once to Washington. Thereupon Barton made a call on Captain Fraser, and in consequence of this call some unusual orders were drawn up and signed.

The same day as the conference with Barton which resulted in the message to Heringham, Evans happened to pass Ensign Coffee on the deck of the flagship *Delaware*. Coffee glared savagely at him, realizing that, though he did not know why or how, some power above himself had caused the punishment he had sought to inflict on this insubordinate warrant officer to be so mitigated as to amount to little or nothing. At least, here he was walking the deck as freely as ever, but four days after his attempt to jump ship, when he should by rights still be confined to his room, if not in irons.

"That reminds me," said Evans to himself, "that there's one more bit of house-cleaning needed on this ship. I'd better attend to that now before I forget it."

He knew that his agents in the Bureau of Engineering were now able to handle his messages to Mortimer; so he went to the radio room and once again "tested a transmitter." With his hand on the key he made the cryptic dots

and dashes which the powerful transmitter translated into silent ether waves speeding across the sea, while the operator on watch sat listlessly by, waiting for him to finish.

"The gear's working well," said Evans; then rising, handed the head-phones back to the operator, and returned to his room, where he got out some warm clothing and made ready for a long journey on which he must travel light.

The next morning in Washington Rand transmitted to Secretary Mortimer the following message:

Get Ensign J. L. Coffee transferred as far away from flagship as possible. Can recommend him wherever red-tape is needed. E.

Later in the day Evans was talking things over with Elkins in the radio room, when a yeoman from the coding room handed Elkins a dispatch. He opened it and read:

Detach Ensign Coffee to proceed immediately to Washington, report Bureau Navigation.

Elkins handed the dispatch to Evans, saying, "I wonder what in hell they want him in Washington for."

"That's an interesting matter for speculation," said Evans, and went about his work.

When Coffee received his orders, he was in the act of boasting to some of the other ensigns of the way he had carried out the instructions of no less an official than Commander Rich to squelch insubordination in the warrant officers under him, should he see any. He was telling how he was getting that man Evans to toe the mark, and how he was going to give him some more medicine before he got through. His jaw fell when he read the dispatch. The other ensigns tittered.

"Save your medicine for some one else, Coffee," said one.

"Be sure you don't swallow any of it yourself, by mistake," said another.

Coffee, however, though profoundly chagrined, soon convinced himself that there must be an important mission awaiting him in Washington.

CHAPTER XIII

THE SHOW-DOWN

IN 1919 when the N-C 4, the colossal flying boat built for the purpose by the American Navy, made her epoch-making flight across the ocean, there was, among many others, one great difficulty surpassing the rest, which made the task well-nigh impossible. The distance from Newfoundland to the Azores was so great that the problem of building a machine with a hull strong enough to alight safely on the waves, with a load of fuel sufficient for the journey, yet still able to lift the required weight off the water, taxed the available engineering talent to the limit. When all that had been deemed essential was put aboard, the boats were actually unable to rise into the air. Something had to be discarded. The margin of fuel above what the flight would consume was already so small that the commanding officer was unwilling to reduce it further. Therefore the emergency radio transmitter was left behind, and in consequence the N-C 3, flagship of the flight, was nearly lost with all on board. This much is history, but let us get on with our story.

In the years between 1919 and 1937, science and engineering had done wonders, but they had not lessened the number of miles between Newfoundland and the Azores, nor enabled seaplanes to fly without fuel nor to alight on ocean waves without strong hulls. The problem of flying seaplanes across the ocean under their own power was still acute. Seaplanes manufactured in the States were needed in steadily increasing numbers at the great center of naval

activity in the Azores. Cargo space on ships could ill be spared for their transportation; they must transport themselves. But instead of attempting to cross the wide ocean in a single hop, they divided the journey in two stages by means of a great floating hangar midway between Newfoundland and Fayal. Thus the load of fuel required was cut in two.

This floating hangar was little more than a glorified scow with a huge sea anchor to windward and engines of just power enough to supplement this in holding her against drifting away from her station when the wind was strong. Two long arms or wings projecting to leeward from her hull enclosed a large sheltered pool, and giant plates, extending deep down under water from the flanks of these arms, broke the waves, so that even in the heaviest gales the surface of the pool was smooth enough for the planes to alight. Fuel tanks, repair shop, quarters for crew of hangar and of passing seaplanes, fast seagoing motor-boats for rescue and salvage work, and storage space for a few planes comprised the rest of the equipment.

A gray lifeless dusk was about to close in on this lonely floating station the day after Barton had called on Fraser. In a deckhouse was a sort of wardroom where were wont to gather the officers in charge and the pilots of such planes as were attached to the station or had stopped there in passing. A group of pilots was sitting round the table looking over the latest weather bulletin received by radio; this promised a clearing of the sky before morning. The sky had been overcast for two days, and the officers now began their usual custom, on such occasions, of getting up a pool with bets on the number of miles off station that the navigator would find them to be with his early morning star sights. One man bet as high as ten miles.

"That's absurd," said another. "They know just what the ocean currents are round here by now, and they've got indicators to show just what drift the old scow makes. They're always making allowances for all that. I don't believe we'll be over three miles off."

"I'm from Missouri on this dead-reckoning with a scow riding to a sea anchor, and a one-horse engine to get home with," said the first.

"Well," said the other, "you back your notion with your dough, and I'll back mine. If it clears off like they say it will, we'll see to-morrow who's the richer for the deal."

The skeptic rose from the table, yawned, stretched, and sauntered to the window where he looked out over the endless gray waste of water on which the leaden sky was already beginning to cast the gloom of approaching twilight.

"Gosh, what a dreary place this is!" he said. "I hope they won't keep me stuck in this billet many weeks; the monotony of it will just about drive me silly."

"That's the kind of thing you've got to expect in war," said another officer, older than the rest — one that was permanently attached to the floating hangar.

"I'd give my eye teeth," said the skeptic, "to be out where there's something doing — looking for enemy subs to bomb. Good Lord, all we do here is to go out to find some blighter who can't keep his engine running and has flopped on the water, and tell him 'cheerio' while he waits for the motor-boat to come and salvage him. Why can't they teach these bums to fly, before sending them out here with brand-new planes, anyway?"

"If they did that, you'd have even less to occupy you than you have now," said the older man. "As for hunting subs, I'll bet you'd find that a damn sight more monotonous than this. Here you at least find the blighter you're looking for."

The conversation was suddenly interrupted by the signal, "Action Stations." The pilots ran to their planes, and the older officer ran to his station in the pilot-house where he found the commanding officer studying the eastern sky with his binoculars.

"What's up?" he asked.

"A big seaplane coming this way," answered the commanding officer. "She looks like an American plane, but we're not expecting any from there, and we've had no radio from Punta Delgada or Fayal that would indicate any plane was coming. So I called out the gun crew to be ready in case of trouble. Give a recognition signal — she's near enough now to see it."

The signal was flashed out — a series of brilliant colored lights — and instantly the answering signal was seen to flash from the approaching seaplane, already visible to the naked eye.

"She's American, all right," said the skipper, "but what's she doing coming here now? I thought they needed all their planes right there. And why haven't we had any word of her coming?"

The roar of the four big engines was already audible, and soon the great plane with her wing-spread of a hundred feet, swung round to leeward of the hangar, swooped down, hovered low over the waves, and settled gracefully on the smooth surface of the water between the sheltering arms of the giant scow.

The great seaplane was warped into the landing stage, and down from the hull clambered her pilot followed by Barton, Evans, and the prisoner, Long.

"Where's the Captain?" asked Barton of the seaman who helped him on to the landing stage.

"Right here," said the skipper, hastening down from the pilot-house.

Barton handed him a slip of paper. He looked at it; then turned quickly to his orderly.

"Tell Mr. Jones I want to see him at once. Commander Barton, come to my room and I'll have supper for you right away. The gunners can go to the wardroom. I'll have the plane ready for you to go on in half an hour."

Lieutenant Jones, the executive officer, appeared, on the run, and saluted.

"Mr. Jones, have the tanks of this seaplane filled with gas and oil, have the engine carefully inspected and the best emergency crew fully equipped and ready to take her; they are going on to Trepassy Bay, and everything must be ready in half an hour. Have supper for the crew that brought her in; they'll stay here."

The skeptic was told that he was to take the big seaplane on the next lap of her journey;—the monotony was to break more abruptly than he had hoped. Never had the routine of this floating relay station been so violently shaken. Today a new record for speed was made, for the slip of paper called for speed, and it bore the signature of Admiral Johnson. In arranging with Fraser for the trip, Barton had told him nothing of his confidential relations with Evans, but merely stated that since the case involved tampering with the radio gear in the flagship, which Evans had discovered, he wanted to take him along as a witness.

In half an hour, as the tired crew that had brought the giant seaplane on her flight from the Azores, refreshed by hot coffee and cigarettes, were beginning to wonder how long they were doomed to stay at this lonely spot in mid-ocean, Barton, Evans, and Long climbed aboard the seaplane once more. Long was shackled to his seat, so that he could not by a sudden leap deprive them of his services as a witness. The skeptic took his place in the pilot's seat; and

with a deafening roar from her engines the great creature rose off the water and shot away into the twilight where she was almost instantly lost to view. Looking back ten minutes later, the pilot saw twinkling faintly astern the light on the floating hangar that guided seaplanes to this haven of rest and refuge on the lonely sea.

It was only just after two in the morning when the commanding officer of the great seaplane base at Trepassy Bay, Newfoundland, was roused from his sleep and handed a slip of paper which caused him to spring out of bed and order the best seaplane at the base to be ready at once to take passengers to Halifax.

At Halifax they stopped for breakfast while a fresh plane was being prepared to make a non-stop flight to Washington. Before nine they were on their way again, dropping the islands and promontories of the Nova Scotia coast behind them at a rate of ninety miles an hour. As they passed over the heel of Cape Cod, flying high, Evans could make out the long white line of Monomoy Island with its sandy ocean beach. The memory returned to him of the same white line when last he had seen it over the roaring breakers, showing dimly through the rain from the *Petrel's* cockpit, on his adventurous sail with Mortimer.

It was toward the end of the afternoon that the strange trio arrived in Washington, quite unheralded. With the utmost care to keep Evans concealed from Rich's possible spies, Barton found Mortimer and brought him secretly to the place where Evans was awaiting them. Mortimer told them all that had transpired in Washington and how Rich had found in Goss the real culprit. Then they in turn recited the evidence they had obtained at the Azores implicating Rich. The behavior of Long and his visible agitation on the mention of Rich's name seemed to Mortimer

suggestive, but not conclusive; so did the testimony of Elkins concerning Rich's advice to Captain Brigham, but this, having passed through so many months, carried less weight than the other. The report of Heringham, however, made him feel that the case, indeed, looked bad for Rich. After some consultation it was decided that, unknown to Rich, Mortimer should assemble Admiral Rallston, Chief of Naval Intelligence, Barton and Evans in his office, and then send for Rich and question him. Long would be held under guard where he could easily be brought in, and Commander White could be summoned at any time from the Bureau of Engineering to repeat the significant words of Captain Brigham, if it seemed desirable.

The next morning Evans and Barton were smuggled into Mortimer's office with every precaution that no word of their presence should reach the ears of Commander Rich. Admiral Rallston then came, and all sat down where they could watch the face of Rich as he entered the door. Rich was then requested to come to the Secretary's office. So cordial had been their relations that he now felt sure all suspicion of him had vanished, and he obeyed the summons without misgivings.

With breathless suspense the others awaited his arrival. The door was opened by an orderly and Rich entered. All eyes were on him. As he saw Evans sitting before him, his face blanched visibly and there was the least suggestion of a tightening of his muscles. But in an instant he was all cordiality, his self-possession never better.

"This is an unexpected pleasure," he said to Evans. "I hadn't heard you were returning from the fleet so soon."

"You wouldn't," answered Evans; "the Bureau keeps you occupied with larger issues."

"Indeed," replied Rich graciously, "I hear often of the

splendid work you have been doing for us in the fleet in keeping our equipment in working order."

Equally gracious was Rich in his greetings to Barton and Admiral Rallston.

Then Mortimer, bracing himself for the effort, spoke.

"Commander Rich," he said, "I regret to say that a man from your division of the Bureau of Engineering was found purposely damaging the radio apparatus on the *Delaware* under pretense of making changes indicated in orders from you."

"Indeed?" said Rich, his composure not the least bit ruffled, yet with an appropriate display of surprise. "And what was his name and rating?"

"Radio Gunner Long," answered Mortimer. "Do you remember him?"

"I think I recall his name," said Rich, "but we have so many in the Bureau I find it hard to know them all. At all events, I should not have been directly concerned with planning the work of such a man. The officers under me lay out the work and make out the orders; they merely bring them to Admiral Bishop or me to sign. It would be impossible for me to give any clue to this particular case off-hand; but I can start an investigation at once, and we can probably trace his orders to their source."

"Unhappily," said Mortimer, "evidence was brought to light which appeared to point unmistakably to you as the real author of the plan to damage the apparatus."

"Mr. Secretary," said Rich, with impressive dignity and earnestness, "it is impossible that you have given credence to such slanderous accusations after our years of close and cordial coöperation in the prosecution of the war."

"Indeed," said Mortimer, "I was loath to listen to them till the mass of evidence seemed overwhelming."

"It must, indeed, have been overwhelming to outweigh my years of devoted service to the navy. May I ask what this overwhelming evidence is?"

"A number of things about the behavior of this man Long appeared to those who apprehended him only capable of interpretation as signifying your complicity with his acts. These facts, coupled with the changing of messages last week, and the simultaneous disappearance of Mr. Tompkins, which present indications seem to show are not as easily explained as you made them appear to be then through the agency of Goss, have led to the accusation."

"All these things can still be perfectly well explained. Goss confessed to tapping the wires and impersonating me, as you yourself can witness; Tompkins was probably himself implicated, and, hearing of Goss's fate, has either absconded or committed suicide. The evidence associated with this man Long, you speak of, can be explained on proper investigation as easily as all the rest. I think, Mr. Secretary, you are doing me an extraordinary injustice to so much as listen to these accusations after my years of devoted service. Perhaps the gunner, here," indicating Evans, "who has at times been impatient with me for not accepting new-fangled ideas as quickly as he would like, has been poisoning your mind against me."

"Since you bring up that issue," said Evans, "I should like to ask why, if you are indeed the gallant and loyal officer you modestly concede yourself to be, you told Captain Brigham the *Delaware* would be better off without the equipment you had authorized to enable her to direct the fleet in action."

A dark scowl showed for an instant on Rich's face. "It's a lie," said he; "I never said such a thing to Captain Brigham or any one else."

Evans turned to Mortimer.

"Commander White's testimony on that point might be interesting," he said.

Commander White was summoned. When he entered the room, Mortimer said to him, "Commander White, I wish to know if Captain Brigham, while chief of staff, ever said anything to you about remarks by Commander Rich to him on the subject of the radio equipment of the *Delaware*."

"He did say something about that, sir."

"Do you remember what he said?"

"It is some time ago, but, as I recall it, Gunner Evans had just said something to him about the set not being in good working order according to the specifications of the Bureau, and he had told the gunner the set was the way he wanted it. When Gunner Evans had gone, Captain Brigham told me that Commander Rich had said he didn't believe in most of the newer equipment, and he thought it would be just as well not to attempt to keep it all in working order, but to rely in practice on the old-fashioned gear."

Commander Rich then said: "I don't recall making any such remarks as that. Captain Brigham and I had frequent conversations, and at some time I may have said that some of the older gear had stood up well in service and was in some ways more reliable than some of the newer devices. Mr. Secretary, you know how easy it is to misquote a man, even with the best of intentions. Some remark of mine has been misunderstood and then passed from mouth to mouth till it actually is held up as evidence of treason. The thing is ludicrous. I never dreamed of advocating anything that would impair the efficiency of the ships."

Evans spoke next. "The efficiency of the *Delaware's* radio room as it was in Captain Brigham's régime might well be likened to that of a Ford car with one cylinder work-

ing and no front wheels. In spacing the battleship divisions most effectively for the concentration of gun-fire, in disposing the cruiser squadrons and destroyer flotillas, every bit of modern equipment authorized by the Bureau is needed. Messages must often go out simultaneously on as many as five different wave-lengths. With the gear as Captain Brigham had it, that would be absolutely impossible; the team-work of the fleet would be crude and clumsy — worse, it would be paralyzed. Our ships, rambling incoherently over the ocean, would be at the mercy of the enemy if ever they were brought to action. That is what Brigham's efficiency stood for."

"Mr. Secretary," said Rich with dignity, "I have already told you that I never advocated any neglect of radio equipment which could have impaired the efficiency of the fleet. The gunner here is obsessed by an exaggerated sense of the importance of certain devices in whose development he has been interested. When he found them not working as well as he would have liked, and Captain Brigham not as much interested in them as he was, he built out of some misquoted remark of mine an elaborate picture of high treason."

Evans shrugged his shoulders and looked at Barton. The case against Rich did not appear on the face of it as clear and convincing as it had before the defendant's eloquent tongue had been mobilized in his defense. But Barton held in his hand a strong card of which he had as yet given no intimation. During the night, after hearing from Mortimer how Goss had been caught and driven to confess, he had interviewed Long. He now rose and went to a door leading to an adjoining room, opened it, and beckoned Long to come in. As he entered, all eyes were not on him, but on Rich. When this officer saw the prisoner enter, he started and

turned pale. To the watchful eyes of Barton the look of guilt on his face was unmistakable. Mortimer was rather struck by the ease with which he regained his composure after the surprise of seeing one whom he thought to be in the Azores, suddenly brought before him.

Barton then handed to Mortimer the original orders under which Long had been sent to Punta Delgada, formally signed by Admiral Bishop as Chief of the Bureau. Mortimer read the orders; then questioned Long as to his mission and how he had come to be sent on it. Long's voice trembled as he answered:

"Commander Rich explained to me that my task was to damage the radio equipment on the flagship — and later on the division flagships — as much as I could without its being discovered in time to repair it. Before I went he called me to his office in the Bureau, where we looked over the diagrams of most of the apparatus, and considered the best places to damage the sets in a way that would not be found out till they were called on for heavy usage. After making a few suggestions he left it to me to work out the details."

"This is the most preposterous fabrication I have heard yet," called out Rich in high dudgeon.

"Just a moment," said Mortimer. "I wish to ask Gunner Long a few more questions, then we can have your comments." Then, turning again to Long, he continued, "How did you come to be in the service, and how did your relations with Commander Rich come about?"

"Goss and I were working as electricians in a factory in New York where they make radio apparatus. We had been in this country since we were boys; I came from Bulgaria and he from Thrace. Just before this country joined the war, Commander Rich, in civilian clothes, came to see us

and talked with us for a long time, asking us what we knew of electricity and how we felt about the war. We both were on the side of the Balkan Powers in our hearts and had no feeling of obligation to America. He told us this country was soon going into the war and that the rulers in Constantinople had things so well planned and organized that they were sure to win, and America would then be under their rule; and any one who had helped the cause would be in luck. Finding us disposed to work for that end, he told us that he was an agent of the Constantinople Government and had been holding a position in the United States Navy for some years, and showed us documents proving his statement. He offered us jobs in the Bureau of Engineering with the salaries of our ratings and in addition an equal amount from a secret source at his disposal. We both accepted the offer, and as I was the older and more experienced, I was made a radio gunner, while Goss was enrolled as chief radio electrician. He promised us both rewards either in money or good positions at the close of the war, and assured us he would then control great power.

"Goss was my best friend in the world. No man was ever more faithful; never did a man face the dangers of that work more bravely or more cheerfully than he. If Commander Rich had stood by him, nothing on earth would have made me tell. Till yesterday I stood ready to keep my mouth shut even if you tortured me. But last night I learned how this cur had betrayed my friend and foully done him to death. And now I am ready and glad to tell you the truth. Goss never faltered. He was ever ready at the master's bidding to risk discovery, tapping wires and impersonating others. When Rich found himself cornered, he turned to Goss and ordered him to reveal his mimicry that he himself might escape the net."

All eyes were on Rich. His face wore a sneering look.

"Mr. Secretary," he said, "it seems to me that story is pretty thin, I might almost say transparent. You, as a lawyer, have doubtless seen through it yourself already. This man is a spy; we all know that. He was caught in the act of doing the work he has just described. Goss was his friend; they were confederates. Now that he has been caught, and his plan frustrated, he naturally wants to shift the burden of guilt, as much of it as will shift, on to the shoulders of some one else. Whom will he try to implicate? Naturally the head of the division in charge of radio apparatus. It would help his case to do so, anyway; and now that he finds on his return that I discovered his friend and confederate, and caused his execution, naturally his desire for revenge makes him all the more eager to accuse me. With two motives, both strong, one might almost predict in advance that he would do just this. As for his story, any one who wanted could invent it in ten minutes. Surely you will not be so simple as to believe it."

Long was seeing red. The storm of pent-up feeling, brewing as Rich delivered these remarks, now broke.

"You vile scoundrel!" cried the prisoner. "Goss served you to the last, and you betrayed him; you made him use the skill that had served you, to bring on his own death sentence, to save your dirty hide."

"Mr. Secretary," said Rich, "on my honor I am innocent. A man of your experience will not take the word of a confessed spy with an obvious grievance, against that of an officer tried by years of service in the navy."

"Probably not, if that were the only evidence," said Mortimer.

"I demand of you in the interest of fair play," said Rich earnestly, "that Admiral Bishop, Chief of the Bureau of

Engineering, be permitted to come and speak in my defense. I am certain he will assure you of my innocence."

"Very well," said Mortimer, "I will send for him at once."

In a few moments Admiral Bishop was ushered in, looking more pompous, his face redder and his whiskers whiter than ever. Mortimer told him briefly the story of the suspicions and charges, and summarized Rich's defense. Admiral Bishop could hardly contain his indignation.

"This is the most outrageous frame-up against a loyal officer that I ever heard of," he said. "Commander Rich has been my right-hand man throughout the war. He has contributed more than any one in Washington to the high state of preparedness of the navy to-day. Ask any man who has been close to the organization of radio communications in the fleet during recent months if the efficiency of the apparatus is not a signal tribute to the responsible man at the head."

"We have just heard from one man who has been very close to radio communications in the fleet," said Barton, "and he didn't seem to look on their efficiency in that light."

"Who?" asked Bishop.

"Evans," replied Barton. "He seems to feel that our communications are working well in spite of Commander Rich, not because of him."

"The gunner here!" said Admiral Bishop in surprise. "You don't expect me to yield to a radio gunner in my judgment of the men in charge of the divisions of my Bureau?"

"No," said Barton, "only you said, 'Ask *any* man who has been close to the organization in the fleet,' and he was one; that's all."

Barton deemed it unwise to mention before Rich anything of what he had heard from Herringham about Rich's

status in enemy circles. He had mentioned this to Mortimer in private, but the skill with which Rich had parried all attacks thus far, and the stanch support of Admiral Bishop seemed to have obscured that testimony in Mortimer's mind; and the upshot of it was that he seemed perplexed and rather inclined to lean toward Rich's side of the case. Barton therefore left the room, and, when out of sight of the others, beckoned Mortimer to follow. In a moment Mortimer excused himself and joined Barton in a corridor where they could be far enough to be safe from eavesdroppers while they conversed in whispers. Barton then reminded him of the testimony received in the secret messages from Heringham in Constantinople.

Mortimer thought a moment and then remarked: "That might all have come from some spy who has caught on to Evans's method of getting messages from Gibraltar, and has smuggled in fake messages implicating Rich."

"That is extremely improbable," said Barton. "Anyway, there are so many things all pointing the same way I am convinced of his guilt."

"He has offered a reasonable explanation of every item thus far," said Mortimer. "I don't see how we can prove the case against him without something more definite and unanswerable than we've got."

While this whispered conference was going on in the corridor, Commander Rich and Admiral Bishop were making things as uncomfortable as they were able for Evans. The Admiral was so incensed by the affair that he freely proclaimed his indignation — men who made such accusations against one of Rich's integrity and distinguished service ought to be imprisoned. Rich, with malicious insinuation, turned the odium of it upon Evans who, glum and silent, paid no apparent heed.

Mortimer and Barton in the corridor outside were making little progress with their conference and were about to rejoin the others when Mortimer's attention was drawn to the sound of a man's voice talking rather excitedly to one of the clerks in the outer office. He listened and could hear the voice saying, "It is most important that I should see him at once."

Then he heard the clerk say, "He is having a very important conference and can't be disturbed."

Mortimer stepped into the outer office and saw that the man with the excited voice was Rand.

"Did you wish to see me?" he asked.

"Yes, at once," answered Rand breathlessly.

Mortimer led him into the corridor.

"What is it?" he said. "Tell me in a whisper. We can't go in there now."

"Tompkins has just appeared," said Rand in a hoarse whisper. "He was kidnaped and has just escaped. His story is most important."

"Where is he now?"

"In his own office," said Rand.

"Bring him here at once," said Mortimer.

Rand disappeared on the run, and in less than three minutes returned with Tompkins, looking thin, worn, and exhausted. Tompkins then told how on that memorable morning when so many things happened he had gone early to the Secretary's office with the message from Evans, and, not finding Mortimer, had returned to his own office, and how, when he next set out, Commander Rich had dealt with the situation.

"Commander Rich called you up and explained the situation, then handed me the phone," he said. "You probably remember the conversation; as I recall it, you said,

'It's all right, give Commander Rich the message. It will excite less notice if you don't keep coming to my office.'"

"You say I said that?" broke in Mortimer.

"Yes, sir."

"I never had any telephone conversation with you at all that morning," said Mortimer, "nor with Rich till after I received the message delivered by his messenger."

Tompkins stared with amazement.

"This is the most important testimony we've got," said Barton. "Go on, and remember to speak quietly."

Tompkins then told of his kidnaping, the long motor-ride into the mountains and the days of imprisonment in the abandoned logging hut with the scantiest food supplies, under guard of five armed ruffians.

"A few days ago they had an altercation. There were whispered conferences and arguments just out of my hearing. Angry words passed, and I don't know just what happened, but pretty soon I found that three of the five had deserted, leaving only the two to guard me. The food got low and one of them had to walk a long distance to get more; he got back pretty tired. The two of them drank some liquor and started taking turns at watching through the night. Just before dawn the man who had gone for the food, having stood watch since midnight, dropped off to sleep; the long walk and the liquor were too much for him. I was sleeping with one eye open. When I was satisfied that he was asleep, I slipped out of the hut. The dawn was just breaking, and I picked my way down a wood road, and then ran till I had got a good mile from the hut. I tramped nearly all day and in the afternoon reached a village where I learned that I was at the edge of the Shenandoah Mountains. I hadn't a cent, but I got a man to take me down in his flivver to a railroad town where I induced the bank

president to trust me and give me a night's lodging. That was yesterday, but it seems like last year. This morning he lent me the railroad fare to get back to Washington. I took the first train this morning, and got in about an hour ago."

Barton asked a few more questions, and then said to Mortimer, "I think we'd better have him come right in and give his testimony before the others."

Then he explained to Tompkins that Rich was charged with treason, and they were in the middle of the investigation.

Mortimer and Barton reentered the room, and then, with their eyes on Rich, beckoned Tompkins to follow. As Tompkins entered, Rich caught his breath with a gasp. There was no mistaking the pallor on his face now, nor did he regain his composure as easily this time.

Tompkins then recited the details of the momentous morning when Rich had intercepted his message. Mortimer explained to Admirals Rallston and Bishop that he had never taken part in the alleged telephone conversation, that the message which Tompkins tried to deliver was identical with that which Evans had later repeated to Rand, and that the message received by messenger, urging the recall of Fraser, was a bogus one. Admiral Bishop was quite bewildered, and got lost in the intricacies of the conflicting narratives. Rallston, grasping the significance of the revelations, looked very serious. Evans, alert and missing nothing, was looking more cheerful.

Mortimer turned on Rich.

"How do you explain this telephone conversation in which I never took part, but in which Mr. Tompkins understood me to instruct him to deliver his message to you?"

Rich, once more perfectly at ease, replied: "I explain it by telling you it is a lie; just one more bit of this whole

elaborate frame-up. I told you Tompkins was probably involved in this business, and had probably absconded."

"Or committed suicide," put in Barton.

Rich ignored the interruption and continued: "When he heard that there was a conspiracy on foot to discredit me, he saw his chance to get in on the thing. He has doubtless been in conference with others in his gang, and they have decided that this story is the best way to play their game."

There was a pause. Admiral Bishop stroked his whiskers and nodded approvingly.

"I think that is a very reasonable explanation, Mr. Secretary," he said.

Evans then spoke.

"I think there is now a chance of putting this thing to the test of something better than words. Until Tompkins entered the room just now I had no idea he was in Washington; I didn't know whether he was still alive. I have therefore had no possible chance of collusion with him since I got home from the Azores. Are you satisfied on that point?"

"Perfectly," answered Mortimer.

"I should now like to ask Tompkins if he felt sure that he recognized the voice in the telephone as yours," continued Evans. "Is that a fair question?"

"It is," said Mortimer, turning to Tompkins and awaiting his reply.

"The voice sounded exactly like the Secretary's; I had no doubt of it at the time," said Tompkins.

"Now," said Evans, "according to Tompkins's story, Commander Rich went through the usual procedure of calling this room through the Bureau switch-board. In due course a voice, which Tompkins believed he recognized as yours, answered. You never received the call. If Tompkins's story is true, some one must have cut the wires from

Commander Rich's room to the switch-board; otherwise the call would have gone through to this room. Furthermore, some one who could mimic your voice must have been at the other end of the cut wires. When Goss was charged with cutting in on Tompkins's line and impersonating Commander Rich, more than one man in the Bureau testified to having seen him with a portable phone in the vicinity of the wires leading to the switch-board, on the morning when all this happened. He was also shown to be an expert mimic. It remains, then, to see if the wires from Commander Rich's phone to the switch-board have been cut.

"As for the possibility that they have been cut since then in order to corroborate the story, you will notice that Tompkins himself has not suggested that mode of corroboration, and you have granted that he has had no opportunity of suggesting it to me. Furthermore, if his story is true, the wires must have been cut and spliced together again a week ago when all this happened. But if, as Commander Rich suggests, he had made up his story as the result of a recent conference with his gang, after hearing that he had a good chance to get in on the frame-up, then, if he has had the forethought to cut and splice the wires in order to back up his story, he must have done it within a few hours. Now an experienced electrician could tell, on examining the splices, whether they were done within a few hours, or as long as a week ago. In fifteen minutes we can find out whether those wires have been cut, and approximately when."

"I think, Mr. Secretary," said Admiral Bishop, "it would be a gratuitous insult to a distinguished officer to follow the inquiry further by looking for such evidence against him. I am satisfied the whole business is an audacious conspiracy to discredit Commander Rich."

"Don't you think that fair play to Mr. Tompkins requires that we should look at those wires before concluding that he is lying?" asked Mortimer.

"I do not see it," said the Admiral.

"I do," said Mortimer.

The electrician who had installed the wires in the Bureau at the outbreak of the war was sent for; also two other expert wire-men as witnesses. It was a strangely assorted procession that walked through the corridors of the Navy Department from the Secretary's room to the Bureau of Engineering. Secretary Mortimer and Admiral Rallston went first; behind them followed Admiral Bishop and Commander Rich, while Barton, Evans, Rand, Tompkins, and Long brought up the rear. Evans and the electricians set to work removing planks to explore the wires leading from Commander Rich's room to the switch-board. It was not long before Evans, who had chosen a place where a man could work unseen, to begin his search, called the others to come and look. There were the wires, each with a swelling of electric tape. This was carefully removed by one of the electricians, and under the tape the wires were spliced. Every one had a look at the splices.

"Do you recall whether the wires were spliced at that point when you put them in?" asked Mortimer.

"I am certain that they were not," replied the electrician.

"Have you ever looked at them since?"

"I inspected them two months ago."

"Were they spliced then?"

"No."

"Could you swear to it?"

"Yes."

"Can you tell how long ago those splices were made?"

The electrician examined the wires carefully; then an-

swered, "They weren't done within the last three days; I am sure of that. How much longer ago, I can't tell."

The other electricians examined the wires and all testified that the splices couldn't have been made less than four days ago at the very latest.

The electricians were dismissed. Admiral Rallston turned to Admiral Bishop.

"Can you tell me how that evidence could have been faked?" he said.

Admiral Bishop did not answer. All eyes were now on Rich who was an ashy gray, all his affable manner gone, a venomous look of malice on his face.

Evans and Barton exchanged glances, and Barton nudged Admiral Rallston.

"Have you heard anything from our friend Bela since his unceremonious departure?" said Evans casually to Rich. "He has been praising you warmly."

Rich started violently and turned a shade paler; the look of fear and hate in his face was more intense than ever. He opened his mouth to speak, and then, looking at the eyes of the others all grimly watching him, he remained silent. Suddenly he turned on Evans and like a flash drew a pistol from his pocket. Barton, standing close beside him, was watching him like a lynx. Quick as was Rich's hand, Barton's was quicker. With a swift blow he struck Rich's right hand toward the ceiling with such force that the pistol flew from it, and, sailing through the air, fell at Evans's feet. Long's desire to assault Rich now became uncontrollable; like a wild animal he sprang at him and dealt him a blow with his fist that sent him sprawling on the floor.

High officials in Constantinople sent out message after message through secret channels. But the messages remained unanswered.

The day after Rich suddenly ceased to be an officer in the United States Navy, a great seaplane arrived at Trepassy Bay from Halifax just after sunset. Out of it stepped Commander Barton and Radio Gunner Evans, both looking haggard and exhausted. They turned in early at the seaplane base. Next morning before sunrise they were once more on board the same seaplane that had brought them from the Azores, with the same skeptic as pilot, somewhat cheered now by his visit to dry land. At the floating hangar they found the original crew of the plane, well rested now and eager to get back to the Azores.

The sunset colors were fading and the pink stucco buildings of Punta Delgada but dimly showing against the green hills behind the town as the great seaplane hovered over the battleship *Delaware*, answering her recognition signals, and then alighted at the entrance to the inner harbor.

Evans was now easier in his mind, for Rich was no more. But still he was terribly haunted by the fear that Rich or his agents had learned the secret of the code stolen by Wellman (alias Bela), and revealed it to their superiors in Constantinople. Therefore the first thing he did on his arrival aboard the *Delaware* was to send one of his secret messages to Herringham by way of Kendrick, requesting an investigation as to whether the code was still believed to be genuine, and a report as soon as feasible.

Two days later, Evans, listening on his specially prepared receiver at the appointed hour when Kendrick was wont to transmit intelligence from Gibraltar, recognized the significant combinations of sounds which meant there was news for him. Listening eagerly, with quickening pulse he followed the message which came from Herringham. Careful investigation, it said, had satisfied him that implicit trust was still placed in the genuineness of the stolen code.

Evans breathed freely once more. The talisman was still good.

At last, early in April, orders were issued to the various units of the fleet to be ready for sea on a certain night, and a handful of men knew that this foreshadowed more than a practice cruise. This handful of men knew that, by dawn of the morning following the designated night, the entire fleet would be on the open sea.

Two days of feverish preparation followed, during which Evans made hasty visits in the rôle of family doctor, or rather chief consultant, to the radio apparatus of the fleet, diagnosing ailments, giving advice and, when necessary, applying radical treatment to disordered gear.

As the last day before the departure drew to a close, weary with his labors, but satisfied that the fleet was ready for its task, he went to the Borge garden at dusk and ascended the old watch-tower once more. The moon was rising over the sea, and its broad, shimmering wake on the water was broken in a hundred places by the dark forms of great ships, emblems of concentrated might. The moon rose higher till its outline was broken by the branches of the old cedar tree which formed a perfect frame for the great tableau of gallant ships on the shining water. Evans sat and drank in the glory of the picture before him, which for sheer beauty was almost unsurpassed in all his experience; its splendor took his breath away. And as he sat gazing far off over the moonlit sea with the soft air of the spring night fanning his cheek, a sense of the glamour of the great navy with its power and majesty, swept over him. A wild thrill went through him, and long-forgotten feelings of his boyhood seized him. He yearned passionately to do great deeds and play an heroic part in this war for civilization. And as the expansive feeling took hold of him he contemplated his

own rôle as he saw it — a technical man fussing over small details in a small part of the great machine that was going forth to fight — a tiny cog in the works of a vast organization of men, almost a non-combatant compared with the men who would direct the battle, or the spotters in the fighting top. With a pang he told himself that perhaps his part in the war was already done, and the yearning to express the heroic impulse within him must die unfulfilled. Then he rebuked himself for thinking of his own paltry rôle as if it were of consequence. The sublimity of the scene before his eyes inspired him to a larger perspective in which self was submerged and the cause was all.

“If the cause only triumphs,” he thought, “that’s all that matters. And the cause will triumph.”

The majestic fleet dotting the silvery surface of the moonlit sea now seemed to him the symbol of a great hope, and yet, symbol though it was, it was something very personal and very dear to him. Then there came back to him another feeling, long buried deep in the remote past, a feeling once closely linked with the ardent yearning for great deeds, that had fired his youth. There rose before his eyes the vision of one who long ago had meant more to him than life itself, one who when his hopes seemed brightest had been snatched from him through the influence of a dominating and ambitious mother . . . From this his thoughts turned to the memory of his own mother, unfailing in her sympathy, gone now, leaving him the priceless heritage of her devotion.

It was time to return to the flagship. Descending through the shadowy paths of the old garden, he came out at last and threaded his way through the picturesque streets of the town to the harbor front where the Old-World architecture around the landing seemed shrouded in

mystery in the pale moonlight. And as he took his place in the motor-sailer, he felt that his spirit had been far away from the little things that make up the daily life in the fleet, now crowding in on his consciousness and dragging him rudely back from Olympian heights.

By dawn the next morning the vast fleet — battleships, cruisers, destroyers and all — had vanished.

CHAPTER XIV

THE BATTLE

AT Communication Headquarters of the enemy in Gibraltar there were busy times. Radio experts, decoding experts, and Intelligence officers were especially active in analyzing Allied naval dispatches. The code system to which Bela procured the key had been verified by repeated observation of fleet maneuvers, thus completing their assurance that the Allies still placed confidence in it, and were changing code from month to month according to the schedule outlined in the key.

And now activity of special interest was discovered. A considerable detachment of the Allied Navy, scouts and armored cruisers, together with four of the older battleships, was cruising to the eastward of the Azores and approaching near enough to the coast of Portugal to make things look very interesting. Intercepted messages and radio-compass bearings taken on their signals by the shore stations at Vigo, Lisbon, and Gibraltar told the story, leaving no chance of mistake as to the actual approach of ships to the coast. Such a force as this, if cut off from the rest of the Allied fleet, would be easy prey for the Mediterranean Navy; and a chance to destroy it would be a golden opportunity, for the loss of these cruisers and battleships, even though the latter were nearly obsolete and inferior to the first-line capital ships, would be a serious blow to the Allies; it would measurably weaken their navy, and greatly improve the outlook for a subsequent battle between the two fleets.

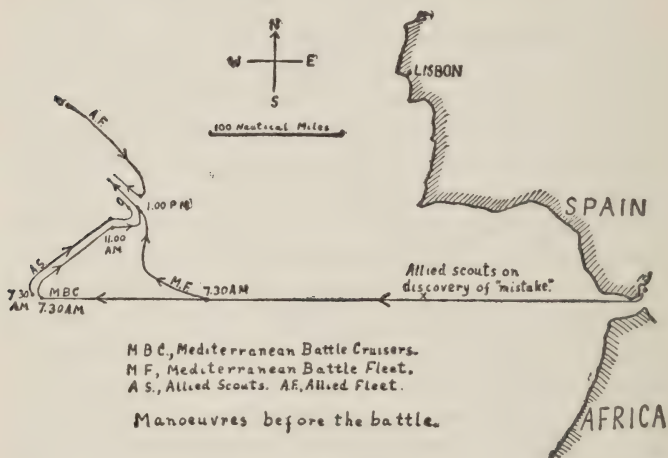
But could this force be really cruising so far away from the main fleet as to render it liable to be cut off from

support? With redoubled vigilance the radio forces in the Portuguese and Spanish stations listened for clues to the presence of a supporting force of capital ships, or to some explanation of the apparently isolated position of the cruiser force.

Now, in radio communications, as elsewhere, the chain is often no stronger than its weakest link. A slip on the part of a single operator entrusted with a message may work vast havoc through the resulting confusion. Before long, as the messages of the Allied flagships were decoded and studied by the enemy experts in Gibraltar, an explanation of the dangerous move of the Allied cruisers came to light. This force, conducting a sweep of the waters east of the Azores on the chance of finding enemy commerce raiders, was supposed to be remaining within reach of the main fleet, still at the Azores; that is, so near that if the enemy should put out from Gibraltar, the cruiser force and the rest of the fleet could, by steaming toward each other at full speed, effect a junction before the enemy battle cruisers with their higher speed could overtake and attack. But a message from Allied Headquarters in Punta Delgada saying, "Proceed no farther to the eastward," had through error been transmitted, "Proceed farther to the eastward." Before the mistake had been discovered, the cruisers had steamed close in to the vicinity of Cape Saint Vincent and Gibraltar. And now, with the slow speed of the older battleships to retard their escape, and with the rest of the fleet far away, the detached force was in a most perilous position. All this was now revealed to the enemy through their analysis of intercepted messages.

Clearly there was no time to lose in giving chase. The cruiser force had discovered the mistake and would retreat toward the supporting fleet with all possible speed. But so

near was it, and so much would its speed be retarded by the slower ships, that the battle cruisers of the Mediterranean Navy could surely overtake it before reinforcements could arrive on the scene.



Emergency orders were given by the Turkish Admiral; steam was raised for maximum speed in the entire fleet, and with expedition denoting a high degree of preparedness and efficiency the fleet steamed off to the westward in search of the detached force. Speed was everything in this pursuit, and soon the advance force of the battle cruisers with a screen of scouts and destroyers thrown out ahead, speeding west at twenty-nine knots, had dropped the main battle fleet out of sight astern. It was nearly sunset when the fleet left Gibraltar, and through the night the race to the westward went on. No radio signals were sent by the advance force, for, though their strength left no doubts in the mind of the commanding officer of his ability to destroy

the force that now seemed almost within his grasp, still it was desirable to avoid revealing his approach, in order that he might catch his prey unawares — he would probably make quicker work of them this way. But every radio operator listened intently for signals from the Allied cruisers. Before the night was over, they had been heard reporting progress and telling their whereabouts to the Allied battle fleet, supposedly hastening eastward in a vain endeavor to come to the rescue before a superior force from Gibraltar should have time to overtake and destroy them. To the great satisfaction of the Turkish Admiral on the battle cruiser flagship, a message soon reached him from Gibraltar reporting that bearings taken by radio compass at Lisbon and Gibraltar on the same message of the Allied cruiser force had verified the position reported by the cruisers themselves, and showed that they were only making nineteen knots. Soon after sunrise the fugitives would be overtaken, and it would not be long before the heavy guns of the battle cruisers had sunk the entire force. Even if the Allied battle fleet had started eastward at top speed as soon as the dangerous position of the cruisers was discovered, they could not possibly reach the point where the battle cruisers would overtake the fugitive detachment before the afternoon. By that time the battle cruisers would have ample time to finish off their victims, retreat, and effect a conjunction with their own battle fleet. The Mediterranean fleet thus consolidated could well afford, if conditions then seemed favorable, to meet and give battle to the Allied fleet, weakened as it would be by the loss of its cruisers and the four older battleships.

At dawn seaplanes were sent up from the Turkish battle cruiser squadron to scout to the westward and look for the Allied cruiser force, and especially to make sure that no

other force, not mentioned in the dispatches, was lurking in the neighborhood. A light southwest wind was blowing; low-lying haze and clouds rendered observations from any great height impossible. This obliged the seaplanes to fly low. Just after sunrise they returned and reported sighting a considerable force of cruisers and destroyers steaming west. Being under orders to avoid approaching enemy craft near enough to be seen, they had returned without getting close enough to make out just what type of cruisers they had seen or whether the four battleships were with them, for the visibility to the westward was very poor. There was no mistake then; their prey was surely theirs. The news was acclaimed with joy on the flagship. The Admiral rubbed his palms together and smiled grimly. He recalled the great deeds of the Turkish navies of the fifteenth century, and gloried in the thought that the honor of adding a new page to their illustrious record would be his.

Onward steamed the battle cruisers, all hands in high hopes of a swift and decisive action. At half-past seven in the morning the lookouts in the Mediterranean scouts, three miles in advance of the battle cruisers, reported ships to the westward. "Action stations" was sounded and the scouting line rapidly maneuvered into battle formation. Overtaking as fast as they were, it was soon easy to make out a long line of scout cruisers to the westward, now steaming on a northwesterly course. But where were the armored cruisers, and where were the four battleships that had been holding them back? The visibility to the westward was low, and probably the scouts and destroyers, having greater speed, had held back to give warning if a pursuing force should come. Probably the rest of the force was a few miles ahead. At all events, the scouts were now in range, and the chance to do them damage was not to be lost. The battle

cruisers opened fire with their big guns, and had landed two salvos close to the fleeing scout cruisers when a smoke screen from the destroyers on their flank hid them from view. When next they were seen through the smoke, they had increased speed and opened the range, so that the battle cruisers' salvos were falling short.

The northwesterly course of the fleeing ships was a considerable change from the westerly course of the pursuit through the night. Possibly the slower ships had turned southwest in hopes of escaping in the low visibility while the scouts decoyed the battle cruisers away to the northwest. Therefore the seaplanes were sent up again to search the sea to the southwest and find the armored cruisers and battleships. After a prolonged search they returned with a report that no ships were to be seen to the west, southwest, or south for a distance of many miles.

Meanwhile the destroyers of the two fleets had come together in an attempt to maneuver for torpedo attack against the larger ships. Lively shelling at close range resulted, but only minor damage was done on either side. In consequence of this diversion, the smoke screen became sufficiently dissipated to enable the battle cruisers to catch sight of the Allied scouts speeding toward the northwest far on the port bow, near the limit of visibility. Again they opened fire and saw their salvos beginning to fall very close just before the smoke screen of the destroyers again hid them from sight.

When next they came into view, they had changed course to north and were already bearing almost dead ahead. The battle cruisers swung on to a parallel course and opened a heavy fire on them, but the rapidly changing range made the targets difficult to hit; so, dodging salvos, the Allied scout cruisers sped northward disappearing again into smoke and haze.

Hitherto the scout cruisers of the Mediterranean fleet had remained only a short distance ahead of their supporting battle cruisers and hence too far out of effective range of the Allied scouts to make it worth while to open fire with their six-inch guns. But now a signal was made from the flagship telling the scouts to pursue and engage those of the Allies.

Putting on all speed and changing course to port, the Mediterranean scouts succeeded in closing the range with their adversaries till it was possible to engage them with their six-inch guns. And now for the first time in the war ships of the same type, evenly matched, engaged in battle. In numbers, speed, and gun-power there was little to choose between the opposing scout cruiser divisions; but in morale the difference was one that told in the tense five minutes after the cruisers opened fire on each other. Those of the Allies replied to the first salvo, which fell short, not only with a salvo from their own six-inch guns, but also by deploying sharply toward their adversaries, thus passing well under the second enemy salvo which screeched overhead, and rapidly closing the range. Hits were scored on both sides. On the Allied ships one gun was put out of action, while several shells burst in pantries, hammock lashings, and other places which caused more annoyance than vital damage. But so heavy and determined was their fire upon the Mediterranean scouts that, with flames bursting forth and magazines endangered, a conning tower smashed, — skipper and all, and two or three guns crippled, confusion and panic began to spread. With the Allied fire growing heavier and their own growing wild, the Turks soon veered sharply away and retreated under cover of the big guns of the battle cruisers.

What with distance, haze, and the smoke screen of the destroyers, only the flashes of the guns on the Allied scouts

were visible to the pursuing battle cruisers; and when their firing ceased as the Mediterranean scouts withdrew, they disappeared from view altogether. But it was not for long; soon they were seen again through a rift in the smoke screen, once more dead ahead, and now heading no longer north, but northeast.

What could this mean? Could it be that these scouts were leading the battle cruisers into some sort of trap? Could there be reinforcements lying in wait to the northeast? This seemed hardly possible. No vessels had been heard sending radio signals in that vicinity, although the net of sensitive receivers, capable of detecting even the feeblest signals, had been constantly spread — an army of vigilant operators listening every instant for the faintest sound. Nothing had been heard save the steady stream of tactical signals between the Allied scout cruisers as they sped away. If the four old battleships and the armored cruisers, reported to have been with the scouts, had gone in that direction, it would be the worse for them, since the heavy guns of the approaching battle cruisers, soon to be reinforced by those of the main battle fleet, coming up rapidly from the east, would make short work of them. No; it was unlikely that the Allied scouts would attempt to lead them toward the detached division of slower ships. The main battle fleet of the Allies must still be far away — in the vicinity of the Azores; the dispatches intercepted the day before seemed to make a certainty of that. This move on the part of the Allied scouts was quite unintelligible. At all events, it was leading them toward the main battle fleet of the Mediterranean Powers. At this rate a junction would soon be effected, and the Turks couldn't wish anything better than that.

The chase continued on a northeasterly course till the

forenoon was well advanced, the fugitive scouts and destroyers of the Allies appearing like shadows in a dream, with bewildering elusiveness; and all this time the main battle fleet from the east, apprised of the course of events by radio from the battle cruisers, was approaching rapidly on a northwesterly course. Most of the time the Allied scouts were out of sight, and fire was withheld, but now and then a fleeting glimpse of them would cause the battle cruisers to "loose off" a salvo or two.

The lookouts on the pursuing ships did not see two American destroyers approach the Allied scouts from the north at thirty-five knots and fall into line on their port beam. But they did see the scouts reappear through the haze and smoke once again at closer range than before, having shifted course to the east. This was better still; — the battle cruisers would the sooner effect a junction with the main fleet.

By noon the men in the fighting tops of the Mediterranean battle cruisers saw the welcome sight of smoke in the south-east denoting the approach of their main battle fleet. A few minutes later the smoke was also seen by the lookouts on the Allied scouts. The Mediterranean fleet was now united in one colossal force, the scout and battle cruiser squadrons taking station ahead of the battleships. Upon this the Allied scout cruisers and destroyers veered to the north. Zigzagging, disappearing behind smoke screens and fitfully reappearing, these scouts presented a maddeningly difficult target for the battle cruisers. With the speed presumably at their disposal they might have drawn away and escaped, but instead they zigzagged and kept reappearing so near that the battle cruisers would open fire on them, only to lose sight of them again in the smoke and haze before the range-finders, spotters, and trainers could get in the

necessary work for hitting the elusive targets. Then, as the order to cease firing was given, the commanders would realize, to the tune of many an oath, that they had only been wasting ammunition.

Thus the running fight went on, the entire fleet of the Mediterranean Powers pursuing a squadron of scout cruisers and a score or so of destroyers on a northerly course, but only the battle cruisers in the van could get within range of the fugitives. For half an hour they held this course; then the zigzagging of the Allied scouts took them farther to the west, till by one o'clock the pursuit had shifted to a northwesterly course. Then for a moment the scout cruisers appeared still well in the lead, but more clearly visible than usual and offering an irresistible target for the big guns of the battle cruisers. But it was only for a brief minute or two, and as the salvos began to splash closer to their mark, six destroyers were seen to dash between the scouts and their pursuers, sending out a dense smoke screen behind which all else was lost to view. The smoke screen continued to lie like a great pall far on the port bow of the pursuing fleet, but the light southwest wind swept it toward their path, and soon the destroyers, dodging behind their own screen, had also vanished from sight. They must, however, still be holding the same general course, for the smoke continued to pour forth, making a wide blanket to the west and northwest; and behind that blanket the scouts were doubtless increasing speed to make good their escape. So said the Turkish Admiral in command of the battle cruiser squadron, but he could not see the Allied scout cruisers behind their screen executing the same maneuver which the German High Seas Fleet executed at Jutland, although the British believed it impracticable in action — a “simultaneous swing-around” whereby,

each ship doubling on her tracks, and all at the same moment, both the direction and the order of the ships were rapidly reversed. Steaming back at high speed, together with the majority of the destroyers — all but the six that made the screen — it was only a few minutes before the Allied scouts were abreast of the main body of the enemy's battle fleet, some miles astern of the battle cruisers. Again the simultaneous swing-around was effected and the scouts closed in on the enemy.

With blank amazement the Turkish Commander-in-Chief on the bridge of his flagship saw the long, slender scout cruisers, nine in number, preceded by some eighteen destroyers, emerge from the thinning smoke and haze barely five miles away on his port beam and come tearing at top speed toward his formidable fleet of giant dreadnaughts. The audacity of it fairly staggered him; here they came into the very jaws of death. The smoke screen, dissipated and blowing across his line, left the visibility good toward the southwest; against the bright horizon sky under the sun the approaching ships stood out clearly, making excellent targets but for their speed, which taxed the range-finders' powers to the limit. Clearly it was an attack with intent to torpedo.

"What madness is this?" gasped the Admiral. "They'll pay for their folly," he added grimly. And all along his battle-line big guns and secondary batteries began to belch forth their terrific fire on the swarm of hornets making their reckless dash. And pay they did. One of the scouts was hit heavily by two successive salvos, burst into flames, and then blew up in a great cloud of black smoke. Another, with steam pouring from the rent deck over her engine room, veered off, dropped out of line, and soon fell rapidly astern. But the other seven came on at a frightful pace,

following close to the destroyers, already hotly engaged by those of the enemy. On came the destroyers through the deadly hail of shot, and some of them came unscathed except for funnels and superstructures, to within six thousand yards of the great battle-line, where each one let go a dozen torpedoes. The scout cruisers, close behind, fired their torpedoes almost at the same moment.

So densely did these underwater missiles swarm toward the great battle fleet that, in spite of every effort to dodge, several vital hits were made. One battleship sank then and there. Another, hit close to the stern, her port propeller gone and her steering-gear smashed, was soon left wallowing helpless far astern. The Admiral in his flagship muttered savagely as he saw two of his best ships put out of action, but he noted with satisfaction the cruel punishment the Allied scout cruisers and destroyers were getting as they turned to retreat after firing their torpedoes. He was eagerly watching his salvos hit, the red glow of the impact, the bursts of flame, the shattered decks and superstructures that marked the havoc wrought by his gunners, when a frightful din behind him made him turn and stare wildly to starboard. There, scarce a hundred yards away, rose the giant splash of a concentrated salvo of heavy shells. With an awful screech projectiles ricocheted overhead, and tons of water came aboard. Only the big guns of a dreadnaught could have sent such a salvo. Where was she? The skyline to starboard all the way from north to east was obscured by the combined smoke of the Allied destroyers and the entire Mediterranean fleet, blown thither by the southwest wind, and merging into the haze. In vain the Admiral and his lookouts searched for the outline of an enemy ship. But then, through the murk, they saw faintly an ominous ripple of orange flashes extending almost continuously for miles

along the northeastern horizon. Not one, but many salvos were on their way through space, coming with deadly aim for his battleships. With indescribable noise the next salvo arrived and straddled the flagship. One shell hit fair on a forward turret, exploded, and put its three guns hopelessly out of action; another started an angry blaze on the superstructure; others tore great holes in the ship's side, wrecking compartments through which they passed. Looking anxiously down the line of ships astern, the Admiral saw an awful picture of fires and explosions telling of havoc already wrought. Confusion and consternation were everywhere. All hands on all ships had been giving their full attention to pouring the hottest kind of fire from full broadsides into the attacking destroyers and scouts as they endeavored to turn and escape from the close range to which they had approached. No one grasped the significance of this sudden development in time to begin training the turrets around to starboard before the second salvo arrived and registered damaging hits on nearly half the ships of the line. Orders were wildly shouted and signals made, and when they understood what was up, with all the speed they could muster the distracted men trained the big turrets to starboard. But what was there to shoot at? Not a ship could be seen; only the dim blur of the orange-red flashes through the smoke revealed where the salvos came from, and these were far too well obscured to enable the range-finders to give the gunners the distance or to offer a target for trainers and pointers. But from a range of twelve thousand yards each of the Mediterranean battleships presented a perfect target in silhouette against the southwestern sky to the battle-line of the Allied fleet.

In the radio room of the battleship *Delaware*, Admiral

Johnson's flagship, there had been a busy scene all the morning. Yet in all the fleet not a transmitter was in action, not a signal was sent by radio, for a single spark might reveal their presence to the enemy and give away the maneuver; but on every battleship and on every destroyer the radio operators were listening intently. Nearly a hundred miles to the northeast, as the running fight between the enemy battle cruisers and the scouts began in the early morning, the Allied battleship fleet, well screened by destroyers, had been maneuvering, guided by radio-compass bearings taken on the tactical signals of the Allied scouts and the signals exchanged between the battle cruisers and the main fleet of the enemy. Since no telltale radio signals could be sent, all messages between the ships of the Allied battle fleet must be transmitted by flag hoist or by blinker — flashes sent by searchlights from the bridge. By this means the radio-compass reports from all parts of the fleet were silently relayed to the flagship, and in return all orders directing operations were sent out from the flagship to the other ships, without making a sound that could reveal their presence to the enemy.

So important was it to place the ships accurately in the desired position that two methods besides those of ordinary navigation were used to coördinate the movements of the battle fleet with those of the decoying squadron of scout cruisers and destroyers. Radio-compass triangulation was worked both ways: first, with the battle fleet as a base line; second, with the decoying scout cruisers as a base line. The second method was a rough one, for in their running fight the scouts offered a poor base line at best. Therefore the main reliance was placed on the base line established in the main fleet. For this purpose, two groups of destroyers, one at each end of the column, were detailed to take radio-

compass bearings on the signals of the scout cruiser flagship, and report them to the *Delaware* by blinker, the reports being relayed from ship to ship all along the column. This method was accurate, but slow because of the time needed to relay the reports. Therefore it was supplemented by the reverse process, the *Delaware* herself taking bearings on signals exchanged between the two ends of the scout cruiser column.

The *Delaware* had two radio compasses at widely separate points on the superstructure, in case of accident to one. At these stations were two men whom Evans had chosen from all the radio-compass operators in the fleet for the speed and accuracy with which they could take bearings. At one of these stations, with an extra pair of head-phones plugged into the circuit, Evans listened in during the entire time of the running fight which brought the fleets together, checking the bearings taken by the operator and reporting them to the plotting room. Thus he gave Fraser a rough estimate of the position of the scouts some time before the more accurate information could be relayed in from the destroyers.

In the plotting room, Captain Fraser, Chief of Staff, with a group of officers plotting the entire development of the action, including the positions and progress of both the advance force and the main fleet of the enemy and of the decoying scouts and the battle fleet of the Allies, received the advance reports which Evans gave him, and prepared in his mind the next step in maneuvering the battle fleet while waiting for the corroborating reports from the destroyers at the ends of the column.

Thus the morning wore on, the mighty fleet, giant dreadnaughts, armored cruisers, scouts, and destroyers, spread out for miles over the wide expanse of ocean, all moving in perfect unison, maneuvered at the behest of Fraser's guiding

mind. Now they would speed up, now slow down, now change course to port or starboard, much as a hawk with watchful eye will hover and wheel before the final swoop on his prey. And ever the suspense grew more acute.

Admiral Johnson on the bridge scanned the wide horizon where his great line of ships stretched away as far as the eye could reach, and farther. Signalmen, tense and alert, awaited the word to flash out orders by blinker or bend on the flags to the signal halyards. Lookouts way aloft strained their eyes to detect the slightest object on the blue expanse of sea.

In the middle of the morning, Fraser, studying on the plotting sheet the converging courses of the three groups of ships, calculated where his decoying force of scout cruisers should next lead the enemy in order to place them in a favorable position for attack. He then dispatched the two destroyers which approached the scout cruiser squadron from the north where the enemy could not see them, with orders for them to shift course from northeast to east.

Soon after this, signals were sent out from the *Delaware* to the rear admirals in command of the various battleship divisions giving them preparatory instructions for the maneuver which should bring the fleet into battle-line when the right moment arrived, and apprising them of the imminence of battle. By this time every man in the fleet knew that momentous doings were on foot, but few knew what the next turn of events would be. The ships were cleared for action.

As soon as the radio reports from the scouts showed that the enemy had joined forces, a third destroyer was sent to approach the scouts under cover of the smoke and haze in the northwest, telling them what course to steer and when to make the torpedo attack which should divert and absorb

the attention of the enemy. The united fleet of the enemy was now only fifteen miles away bearing southeast; the booming of their heavy guns was clearly heard.

On every ship all hands were assembled and told that action of the first magnitude was at hand; the situation was outlined, conditions were favorable, and the outcome was in their hands.

On the *Delaware*, Admiral Johnson spoke to the men himself.

"The great battle is at hand," he said. "Now is the chance of your lives to show what is in you. The outcome of the war is at stake. The advantage of visibility will all be on our side. You will see the enemy better than he can see you. It is a golden chance to do your best at gunnery; so keep your heads and shoot straight, and your first five minutes' shooting will decide the issue. We are going to make it a swift and decisive victory, and it depends on you. In a few minutes' time a detachment of our scouts and destroyers will make a desperate attack on the enemy's battle-line from the farther side, partly to damage him with torpedoes, but chiefly to draw his fire from us. We are asking heroism of the highest order from them; let us see that it is not given in vain."

Then "General Quarters" was sounded. The men ran eagerly to their action stations.

Now began a maneuver of the fleet which would have staggered the imagination of an admiral of the Jutland days. A brief series of signals went out from the *Delaware*, and at the word the countless ships of the fleet commenced an evolution so bewildering and involved that the keenest observer would have seen in it nothing but disorder and confusion. In complexity it surpassed the performance of the most intricate machine. Yet in an incredibly short time

all ships fell as if by magic into battle-line in perfect formation, on a northwesterly course that slowly converged on the enemy.

As soon as the scouts commenced their simultaneous swing-around, they ceased sending signals lest they betray their move; but the destroyers, making the smoke screen where they had been, kept up the patter needed to inform the battle fleet of their progress. As soon as the scouts emerged from the lifting smoke screen and came into full view of the enemy battle-line in their final dash, they began again to use their radio.

The battle fleet of the Allies had now maneuvered into a position northeast of the enemy, broad on his starboard bow, and had swung into battle formation. The lookouts reported sighting the enemy battleships, and Fraser, now in the conning tower, noted with satisfaction how closely their position agreed with that deduced from the great mass of data which had been pouring into the plotting room. The radio compass had not failed. The maneuver, which had been his dream since he scratched the diagram on the ground in the Borge garden, was realized at last; it had worked even better than he had hoped. Then in the radio room the signals of the scouts were again heard.

“Attacking enemy on his port beam — range nine thousand yards — under heavy fire, big guns and secondary battery — range eight thousand yards” — and so on.

Thanks to the greater visibility to the southwest, the enemy battle-line was now clearly in view from the turrets and control tops; the range-finders had measured the range, the targets had been assigned, the trainers and pointers were “on,” and all were in readiness to open fire. Their suspense was nearing the breaking point. Then the results of the torpedo attack appeared; one battleship silhouette

changed to a cloud of black smoke and vanished. The other disabled ship could be seen to drop out of line.

At a signal from the *Delaware*, all at once the broadsides of the entire battle-line went off; in record time the second salvo followed the first, and then the third; and, even before the enemy had responded and his first salvos had come screeching through the air, great fires and jets of steam and smoke told the story of heavy damage already done across the six miles of water.

There was now no more need for silence; the flagship would direct the movements of the fleet by radio, all transmitters would be in action; the radio compass had done its work. Evans left the radio-compass station and hastened to a hatch leading to the main radio room beneath the armored deck. As he crossed the superstructure he saw far away in the southwest the scene of wild tumult, ships on fire, the orange flashes of their salvos, the splashes and hits of the straddling salvos from the Allied fleet, and then the great splashes of the enemy's salvos landing several hundred yards short, followed by the screech of their ricocheting shells overhead. Added to this, the deafening roar of the *Delaware's* own broadside completed an indelible picture in his mind as he went below into the comparative quiet of the radio room, now becoming the busy scene of tactical dispatches coming and going, with Elkins directing the work of coding and decoding.

The scouts and destroyers of the decoying force had paid a fearful price in the climax of their torpedo attack. The seven surviving cruisers, all riddled with shells, some crippled with vital hits, their decks strewn with splinters and wreckage, but all still able to steam, withdrew out of range. Their work was done, and well done. Several destroyers were sunk, for they had come even closer to the

enemy, and thus drawn the heavier fire. Those nearest to their sinking comrades turned, zigzagged, dodged a salvo or two, and then stopped while the shells still fell round them thick and fast, to rescue the survivors, the speed of the enemy battle fleet soon, happily, causing the range to increase just enough to render the rescue something short of downright suicide. Yet many men went down with their ships, thinking to the last, not of self, but only of the fight.

Barely had the attacking cruisers and destroyers on the port side of the Mediterranean column withdrawn, when no less than forty American destroyers appeared darting out from the haze on their starboard bow. With all available destroyers of the Mediterranean fleet busy repelling the first attack on the port side, and with all turret guns not yet crippled, firing wildly into the haze on the northeastern horizon, there was nothing left but the starboard secondary batteries of the battleships with which to repel this new and formidable onslaught. The morale of the gunners, already shaken by the startling turn of events, was no whit the better for the sight of the angry swarm of destroyers charging in with the speed of express trains. Their fire was hot but wild, and soon the sea fairly seethed with torpedo tracks which the battleships desperately maneuvered to dodge, thus dislocating the aim of their turrets.

The torpedo attack was chiefly concentrated on the leading ships and especially on the Mediterranean flagship, for well the Allies knew that morale was not the Turk's long suit, and that a loss of centralized control would severely cripple his fleet. In spite of frantic efforts by the gunners of the secondary battery and vigilant watch for torpedo tracks from bridge and crow's-nest, nothing the helmsman could do availed to dodge the concentrated swarm of torpedoes, and, in less than ten minutes from the landing of

the first salvo, the Mediterranean flagship was hit in the starboard engine room.

The men on the American destroyers, now zigzagging off through a tornado of shell-fire, looked back through the leaping pillars of white, frothy water, and shouted as they saw the great battleship more than half-obscured by a strange patchwork of white steam and black smoke rising in clouds above her fighting tops. Then they saw her, with her engines crippled, listing heavily to starboard, fall out of line, and drop astern. The Turkish Admiral signaled a light cruiser to come alongside, and soon had transferred his flag to another battleship farther astern, swinging well out of line to port and thus taking refuge on the disengaged side of his line during the transfer.

Before his flagship was torpedoed, the Admiral had managed to send a signal to his advance battle cruiser force, ordering them to deploy to starboard and attack the Allied battle-line. The rear admiral in charge of this force, angry at his vain pursuit of the scout cruisers which had led him into the trap, turned his flagship at high speed and led his column impetuously to the attack. At nine thousand yards, in spite of the low visibility to the east, he sighted the American flagship leading the Allied column, and, swinging rapidly on to a parallel course, opened fire on her. The *Delaware*, having seen the enemy flagship hit by the torpedo and then fall out of line, was in the act of training her turrets on the next battleship astern when the enemy battle cruisers suddenly appeared closing rapidly on her port bow. She had barely time to train her turrets on the leading battle cruiser before the concentrated fire of three of these formidable opponents began to pour in upon her. And now came the great test for her manifold radio equipment. There was no time to lose. Signals must be sent to all

battleships within range to support her by diverting their fire to these fast and powerful ships; signals must be sent to all available destroyers to harass them with torpedo attacks; and still the direction of the fleet as a unit must go on, and all without mutual interference of messages. Signals were flashing out simultaneously on different wave-lengths from three or four separate antennæ, both by radio telephone and by radio telegraph. The *Delaware* was now heavily engaged, delivering salvos from all her turrets at the maximum speed, and, in spite of zigzagging, frequently being straddled by the salvos of the battle cruisers. Down in the radio room officers were feverishly coding and decoding messages, some operators were sending them, others tending the control switches whereby the radio telephone was kept running so that the chief of staff in the conning tower could give orders verbally to those units which he was in the greatest hurry to reach. Evans was watching the various ammeters and indicators to see that the machinery ran smoothly, and Elkins was directing the whole show.

Suddenly Evans noticed the metres of the radio telephone outfit doing strange things. Down behind the battleship's armor the general din of action was so confused that the burst of a shell on the superstructure had not been noticed as distinct from the rest. But to Evans the combination of symptoms in the metres told a story.

"The antenna or rat-tail of the 'phone set is broken," he shouted to Elkins. "Tell Fraser. I'll see if it can be fixed." Then turning to the chief radio electrician and pointing to the generator involved, he called, "Shut off the juice and don't turn it on till I tell you." Then, seizing a spool of wire and a strong pair of wire-cutting pliers, he shot out of the room.

A hasty conversation then followed by voice-tube

between Elkins and Captain Fraser in the conning tower, in which arrangement was made for the use of the next most expeditious channel of communication with the destroyer flotilla. Just then Fraser, looking out of the conning tower, saw a figure in dungarees climbing rapidly up the basket mast like a monkey, with a loose wire trailing from his belt. Evans, coming on deck, had found the rat-tail, cut away from the antenna by a shell fragment, sprawling on the deck. Seizing the broken end and securing it to his belt, he started up the ladder, swinging himself out on the framework where necessary to avoid leading the rat-tail foul of stays. As he crawled out at last, clinging like a bee to the chain of insulators that supported the antenna swaying in mid-air, and groping for the ends of the broken wires that had converged from the antenna to the rat-tail, his senses were fairly dazed by the roar and din of the battle now raging at its height. Shells screeched past him, shells hit on the decks, shaking the whole ship as they burst, great fountains of water rose where others fell short and filled the air with heavy spray. Smoke was pouring from a large, jagged hole in the deck; and as he clung there, swaying high in the air, he saw a large whaleboat smashed to matchwood by a shell, fragments of her timbers flung far into the sea. A fire brigade was running aft over the splintered deck, the men looking like ants from the great height whence he caught these fragmentary glimpses of the scene. Every fifteen seconds consciousness seemed suspended as the *Delaware's* twelve sixteen-inch guns let go their salvos — flash, roar, and concussion fusing in one mighty shock that well-nigh stunned and paralyzed every faculty. Half-dazed he could only cling each time till the salvo was over, then renew his efforts to reach the swaying wires; and each time the spotters in the foretop close by, while waiting for the

smoke to clear and the seconds to elapse before the salvo was due to reach its mark, looked round to see if he still was there. At last he reached the wires, and, clinging with both legs and one arm, managed to join together the broken ends by means of the spool of wire in his pocket. As he crawled back, he had a momentary glimpse of the enemy battle cruisers in the west, and could clearly distinguish from the flash of their gun-fire the red glow of the hits made by the *Delaware's* salvos. The action, as he had seen it earlier when he was on his way to the radio room, was mild compared to what was going on now. The *Delaware* was being heavily pounded, but, supported by the three battleships next in line, she was scoring more hits on the enemy than she received, and with heavier shells. Just as he reached the basket mast, there was a concussion which almost shook him off. Looking aft he saw fragments of steel flying from the roof of one of the turrets. With a sinking feeling he realized that in that turret was Lindsay's battle station. A moment later some of the turret crew came scrambling out of the hole the shell had torn. Then to his horror he saw a great burst of flame shoot from the turret and rise to the height of the mast.

Descending the basket mast, he shouted to Captain Fraser as he passed the conning tower, "All ready to use," and hastened below to the radio room where he found the generator already humming again at its task of supplying the power to carry the voice from the conning tower far over the turbulent waters. And as he watched the metres on the panel he knew that the transmitter was again carrying the messages that were directing the work of the fleet. But his heart was sick with the haunting picture of the flame shooting from Lindsay's turret.

A flotilla of American destroyers, stationed ahead of the

column, was now racing to attack the battle cruisers with torpedoes. Simultaneously some thirty more destroyers — all that were left and able to fight of the forty which had just delivered their attack on the enemy's main battle-line — came up from the south to join in this new attack. Meanwhile the destroyers of the enemy, thrown into confusion by the unexpected change in affairs, their coördination completely upset when the flagship of the fleet was put out of action, operated in haphazard fashion, each virtually "on its own," darting about like mad hornets in search of their tormenter. Some of them now came to the support of the battle cruisers, and engaged in lively dueling with the American destroyers at close range. But their haphazard attacks availed little against the team-work by which the Allied flotillas delivered their concerted torpedo attack.

The Allied fleet had a great advantage in visibility all along the line. Not only the main battle fleet of the enemy in the southwest, but also his battle cruisers in the west stood out in bold relief against the afternoon sky. For this reason, as well as by virtue of the heavier guns of the Allied battleships and the disconcerting effect of the torpedo attack, the fire of the battle cruisers soon became wild and ineffective. Vital hits were being made on them in increasing numbers, and soon one of them, on fire in several places, was straddled by a salvo which let the flames into her magazine. With a blaze that lit the sky she burst into fragments, leaving nothing but oil and wreckage when the smoke cleared. Another, hit in a starboard boiler room, was unable to maintain speed, and, to avoid being pounded to pieces as she dropped astern past the entire battle-line of the Allies, turned sharply to port and escaped behind her own line of battleships. The remainder of the battle cruisers, battered and crippled, drew out of range while still they

could, pursued by destroyers racing after like a pack of hungry greyhounds.

And now the *Delaware* and those directly astern of her were able to concentrate their fire once more on the main battle-line of the enemy, or what was left of it. One turret on the *Delaware* was out of action, her funnels and superstructure were riddled with shells, her decks presented a picture of chaos, but in the main her fighting strength was scarcely impaired. The Allied battle-line had maintained a range which rendered them invisible except for the flash of their guns in the northeastern haze and smoke, while the enemy in silhouette against the southwestern horizon made good targets for the American gun-layers. And during the time when the leading ships were compelled to direct their fire on the enemy battle cruisers, those in the rear had been pounding away at their corresponding ships in the enemy's line, scoring two hits at least to one received, till, with turrets smashed, control tops gone, bridges shattered, and superstructures ablaze, the hostile guns were silenced in steadily increasing numbers.

Now, seeing that he had the enemy where he wanted him, Admiral Johnson closed the range enough to render his gun-fire even more effective. This brought his ships into view of the enemy, whose gun-fire was so badly broken that he no longer feared it. Then, as with increasing deadliness of aim the sixteen-inch guns tore holes in deck and armor, the shattering of the Mediterranean fleet became more rapid. And as ship after ship sank, or, out of control and helpless, dropped out of line, the concentration of fire upon those that remained closed in like a Nemesis. Two hours after the first salvo from the Allied battleships the great Mediterranean fleet which had defied the civilized world was reduced to a straggling line of battered hulks scattered over

the sea in all stages of destruction. Before sunset the Turkish Admiral had surrendered.

The casualties of the Allies had been surprisingly light, considering the extent of the action, having fallen most heavily on the scout cruisers and destroyers, although the battleships had come in for a good share of pounding, in spite of their advantage in the matter of visibility. On the *Delaware* the most serious mishap had been in the turret from which the ominous flame had shot forth. The members of the turret crew who had escaped told the story of what happened. A shell had penetrated the roof of the turret and killed several of the crew. Their clothing, ignited by the detonating shell, was spreading fire toward a charge of powder in the loading cage on its way to one of the guns. Lindsay, in command of the turret, seeing that nothing could avert the explosion, and shouting, "Clear the turret!" to those about him, had plunged down through the working chamber into the main trunk and yelled into the handling room below the order to close the magazine doors. Instantly the doors had slammed shut, thus cutting off the magazine from the turret. In another second the fire reached the powder, filling the entire turret, handling room, and all, with a blinding flash which instantly killed all those who had not yet made their escape. Lindsay's quick action which cut off his hope of escape had saved the flagship.

CHAPTER XV

THE HARBOR AT SUNSET

It was an impressive procession of ships that steamed into Punta Delgada two days after the great battle. As the *Delaware*, at the head of the column, battle-scarred from stem to stern, passed the supply ships and fleet-tenders anchored in the roadstead, the shout that went up seemed as if it would lift the vault of heaven. For miles astern the battleships stretched out in an apparently endless line, while destroyers and cruisers lined both flanks. The disabled craft, including the surrendered ships of the enemy, followed more slowly at a greater distance, while those unable to steam were still waiting near the scene of the action for ocean-going tugs to arrive and tow them in.

In the United States not a hint of an impending naval crisis had filtered through into the daily press. So when the news of the victory came, the people were fairly dazed by it. Stirring as it was, and great as was the rejoicing throughout the land, the full meaning of it was scarcely realized at first, for the extent to which the enemy depended on his fleet was not understood by the general public.

But the heads of the Coalition Government in Constantinople understood, and cursed their lot, and trembled in their shoes. And the British Admiralty understood, and lost no time instigating the Foreign Office in London to make certain significant representations to Washington, which figured largely in the negotiations that followed. Before long overtures from Constantinople concerning peace were received in Washington and London. They were met

by a firm and solid front on the part of the Allies. Nothing but unconditional surrender would be acceptable.

The Constantinople leaders, being better endowed with wits than with morale, had little disposition to prolong a futile struggle or continue a losing game, especially as they held the Mediterranean Powers united by a slender thread of intrigue rather than by unity of spirit. The control of the sea irrevocably lost to them, their armies were doomed to ultimate defeat. Therefore, after some clever attempts at bargaining for terms which were coolly and flatly rejected by the Allies, they agreed to unconditional surrender. With explosive force the news spread through the Western world, like a titanic peal of thunder echoing from mountain crest to valley and reverberating throughout the land. The bells rang, and all the populace gave themselves to wild joy or solemn thanksgiving.

As soon as the surrender had been made, the Allied fleet proceeded to Gibraltar to take possession. At the first opportunity for shore liberty, Evans found Kendrick, and for hours they talked over the events since they had separated in the dark on the shore at Punta Delgada. The tales which Kendrick told of his adventures in finding his way to the desired post at a radio transmitter fairly made Evans's blood run cold. A kaleidoscopic sequence of hardships, narrow escapes, and undreamed-of expedients to outwit the enemy, long hours in hiding, disguises, brazen effrontery, and lightning decisions in the face of danger, all told with the unconcern of one used to living in that sort of thing, kept Evans enthralled, now laughing, now as nervous as if himself facing the danger of discovery. Before leaving, Evans arranged to have the kayak exhumed from her hiding-place and sent back to her owner.

June was in its prime when Evans, on his release from

active duty, returned to his home, a private citizen. He went to the university where before the war he had been engaged in research, and asked if he might resume his former position as Associate in Physics and continue the researches which had been interrupted. Some there were in the university who looked askance at the giving of valuable laboratory space to one who had held no more distinguished a position in the war than radio gunner. But there stood his unique apparatus which had taken him years of patient labor to assemble and which no one in the world but he could use. Fortunately the head of the Physics Department understood this, and his wish prevailed.

Evans, assured that his cherished laboratory was his once more, returned to it. The apparatus stood as he had left it, but covered with the dust of two long years. A flood of happy memories returned to him of days and nights spent in enthralling quests. He began eagerly to overhaul and test the apparatus in preparation for the renewed attack on the great problems which awaited his long-deferred experiments for their solution. For a few days he tinkered with the intricate assortment of instruments and devices, inspecting parts here, making minor repairs on them there, looking over old notes, and endeavoring to plan his campaign for renewed research. But as the hot July days wore on, his brain seemed to balk at the task; he realized that he was tired with the deep-seated fatigue which a day's rest or a week's rest will not cure. On the one hand, the din of a great naval action still echoed in his ears; on the other, he heard the call of the sea and the wild New England shore.

"I'll make a better job of this in September," he said to himself. And, closing his laboratory for the summer, he went to New Bedford where soon he was splicing ropes and

helping the riggers at the shipyard put the *Petrel* in commission.

In a few days he was again at the wheel of his beloved boat, the sails pulling hard in the fresh southwest wind. Leaving New Bedford, he headed for the Maine coast. Once more alone in his seaworthy little ketch, he cruised along the coast by easy stages, northward and eastward, farther and farther from the crowded habitats of man, to the spruce-clad, rocky islands of Maine. Off Seguin he stood well out to sea, the gentle rocking of the boat on the ocean swell lulling him into a happy reverie as she glided along before the summer breeze. Passing the Georges and the endless labyrinth of islands in Penobscot Bay, he came at last to Mount Desert Island, where Mortimer, breaking away from his desk in Washington, joined him for a cruise into the unfrequented waters beyond Schoodic. Here there are bays and harbors seldom visited by the great stream of cruising yachts, where, over dense forests of spruce that rise from the water's edge along a rugged shore line, great ospreys wheel and scream, and in countless mossy nooks in the depth of the wood close by the sound of the surf, the witchery of Nature's solitude casts a spell over the lonely wanderer.

Into such a bay, as the gorgeous summer afternoon drew to a close, the *Petrel* steered her course, her sails beginning to droop as the breeze gave way to the calm of evening. Two happy men sat lazily in her cockpit gazing over the placid water into the enchanted forest that lined the shore ahead of them. Through the day, while bounding over the sparkling blue waves, their talk had drifted on, as the spirit moved them, from one phase of the war to another. Evans delighted Mortimer with his pictures of the life in the navy and sidelights on the various admirals and others who had

figured in the official doings. He told of his talk with Fraser in the Borge garden and the conferences that followed — tales which never reached another mortal ear.

The opal tints of approaching sunset were playing in kaleidoscopic reflection on the restless surface of the water, and the dying zephyr just sufficed to give the *Petrel* steerage-way as she headed for a snug little cove among the spruce trees.

The conversation had drifted through all phases of the war to the final action, and Mortimer was for the first time receiving a clear exposition of the underlying strategy and tactics. Evans explained how the placing of every unit of the fleet was worked out to ensure the greatest strength in case of every conceivable unforeseen contingency, and how, guided by the master mind of Fraser, Admiral Johnson's fighting spirit had driven home the decisive blow.

The sun had set, and both sea and sky were aflame with gorgeous colors, while the dark, pointed spruce trees on the shore, now close at hand, cast mobile reflections dancing on the undulating surface of the cove. The anchor splashed and the chain rattled down, and then the sails were lowered and furled for the night. Late into the twilight the two comrades sat watching the colors fade in sea and sky as the great chapter of history just closed was unfolded in reminiscence before them.

"Jim," said Mortimer, "I know you prefer to work in the dark, but it makes me uncomfortable to have you go without recognition. I want to have some open acknowledgment of the Nation's gratitude to you, to ease my own feelings. Would you mind if I did something about it?"

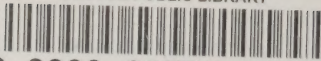
Evans gave his friend a look that spoke his depth of friendship.

"I am well content as it is," he said. "That is something

of a boast, and sometimes I don't live up to it. But I know that in my better moods I'm not bothered that way. The pleasure of praise tends to cloy. Please give recognition to my better self, and let the reward be always, as now, in the doing."

THE END

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THE RADIO GUNNER



